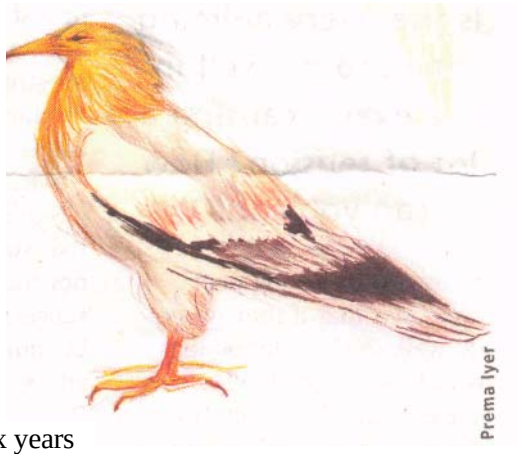
THE HINDU **Saturday,** *March 1, 2003*

Sense & *Nonsense*

A broken tradition

MADHAV GADGIL

Not a chicken, but a vulture
Is this bird of great culture,
Always 4n the dot at noon
Ready with its fork and spoon!



Revered by Egyptians as Pharoah's chicken, the White Scavenger is our smallest vulture. Till six years ago, a pair used to appear every day at noon to partake of a *prasadam* of wheat, rice, *ghee* and sugar, quite an unusual fare for the vultures, at Thirukazhukundram, the sacred vulture hill, not far from Chennai. Equally puzzling was the fact that two, and only two, birds used to show up, although vultures are fond of gathering in goodish numbers to feast on corpses. As the name of the hill suggests, this ritual had been going for a long time, perhaps for centuries. So many generations of vultures must have been involved, passing on the tradition, perhaps from mother to son, or husband to wife. Zoologists define culture as an imitation of patterns of behaviours of one animal by another. Viewed from this perspective, the vultures of Thirukazhkundram certainly qualified as rather unusual animals of high culture. Alas, the tradition now stands broken, and we will never be sure as to exactly how it was being sustained. ®

THE HINDU **Saturday,** *March 9, 2002*

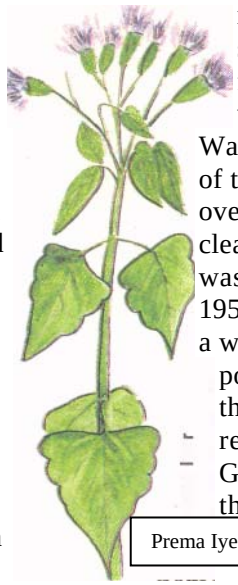
Sense & Nonsense

A forest pest

MADHAV GADGIL

Eupatorium, the white-capped weed
Is innocent of political creed
But when trees are hacked and burnt,
It moves in with scarce a grunt!

Eupatorium, along with Parthenium and Water Hyacinth, is one of the three great plant invaders of India's land and waters. While water hyacinth colonises polluted rivers and ponds, Parthenium and Eupatorium overrun degraded land habitats. All hail from tropical Americas, and thrive in India freed from their native pests and diseases. Both Parthenium and Eupatorium are annual weeds belonging to the Marigold family, with light, wind dispersed seeds that facilitate their rapid spread.



Prema Iyer

Eupatorium prefers wetter tracts, where the forest canopy has been opened up by excessive felling. It reached Kerala with soldiers returning from Myanmar after the Second World War and took advantage of the great spurt of over-exploitation and clearance of forests that was unleashed in mid 1950s. Leaders sporting a whole rainbow of political >, colours led this assault. | So residents of Western Ghats conferred on the weed a variety of names inspired by the fact that Eupatorium wore a white cap in common with many leaders of forest encroachment.

A fitting tribute to the environmental illiteracy of our political leadership! ©

A million feet

An arthritic
millipede
Feeling the heat
Of aches and pains
In its myriad feet
Longed for a way
To beat a retreat
To the earthworm stage
And shed all the feet
Wouldn't that be a treat!



Sanjeeva Nayaka

MILLEPEDES were the earliest animals of any substantial size - at least a few centimetres in length - to set foot -or rather tens of their feet - on land. Beginning with single celled microbes, life arose in the shallow seas, gradually evolving into larger and more complex forms of plants and animals. A milestone in the evolution of complexity is body segmentation in earthworms and their relatives. Another important innovation is limbs.



Millipedes are marine relatives of earthworms with many simple limbs. Adding joints to these limbs and a tough external skeleton, crabs, lobsters and shrimps prospered in the sea. When 400 million years ago plants moved from the sea to freshwater and then onto land, their debris provided a rich food source. Earthworms, relatives of segmented marine worms, and millipedes, relatives of the more advanced lobsters, evolved to feed on this litter. Today, these decomposers play a vital role in maintaining soil fertility and their destruction due to excessive use of chemical fertilizers and pesticides is a matter of grave concern.

MADHAV GADGIL

THE HINDU, Saturday, May 22, **1999**

THE HINDU **Saturday.** *July 21, 2001*

Sense & Nonsense

A nimble *mimic*

MADHAV GADGIL

How magically doth the yogic ant
float in mid-air; Beware you poor fly,
It's that tricky spidaire!



If ever you see an ant majestically floating in mid-air you can be sure it is a spider suspended by a near-invisible thread. Several species of jumping spiders mimic ants in appearance, marching along with their long columns. The ants are by no means deceived and will chase and kill the mimics if they catch up with one. But the spiders are nimble enough to run and jump, and if cornered leap off the support and hang by their silken thread to defy pursuit.

Little is known of the love and life of these anti-mimicking spiders and they present a fine opportunity for Indian naturalists to figure out what makes them tick. All I can record here is the speculation that mimicking formidable ant species like weavers help the spiders evade predators. It is also possible that they occasionally sneak into weaver ant nests and feed on larvae and pupae, although flies are their staple diet. Perhaps one day some young reader of *The Hindu* would be able to tell us much more! ©

THE HINDU **Saturday,** *November 30, 2002.*

Sense & Nonsense

A searching bow

MADHAV GADGIL

Hoot, O hoot, O little owl How I love to see you scowl! At rats and mice Who are not so nice, As by the night you prowl!



Prema Iyer

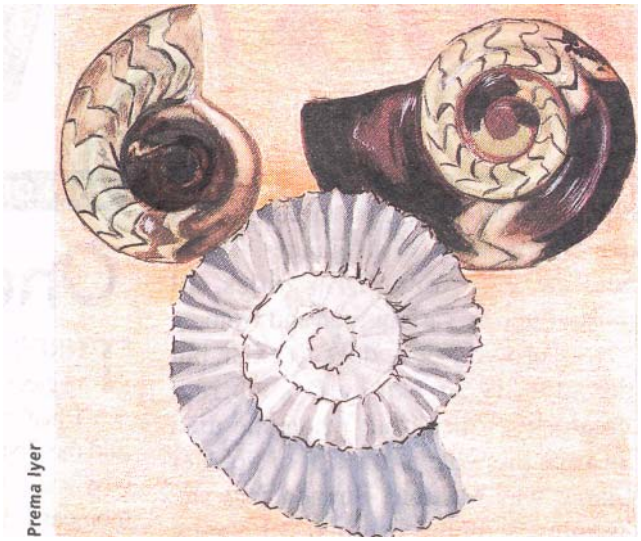
Shunning the mysterious ways of its clan, the spotted owlet has become a most familiar bird of the countryside. It does not wait for the night, but is up and about as soon as dusk sets in. From time to time, it even puts in an appearance in the middle of the day. It is then wide awake, and if stared at, promptly commences nodding and bowing to you with a most sarcastic effect. These greetings are not really in your honour, but are meant to improve the owl's estimate of how far you are. Like us, owls have forward facing eyes. But owls cannot rotate their eyes in the eye-sockets. Owls compensate for this deficiency by bobbing their heads up and down and from side to side, thereby gaining an enhanced depth vision. Their human like faces, their bowings and scrapings, their love for the deep dark night, and their silent flight thanks to the special edges of the wing feathers, all conspire to render owls such uncanny creatures. ©

THE HINDU **Saturday,** *June 29, 2002*

Sense & Nonsense

A second coming

MADHAV GADGIL



A fossilised ammonite thinks it just might have a second inning God and technology willing!

For every group of organisms living on earth today, 20 have vanished forever. One such group that bid goodbye sixty five million years ago was Ammonites; spiral shelled, free swimming cousins of squid and octopuses who ruled the seas for three hundred million years before their disappearance. Many extinct groups have left little trace; not so Ammonites, enormous numbers of whose lovely shells have been preserved in the soft mud of the seas. One such ancient sea was Tethys, bathing the shores of Asia; before the drifting Indian landmass overran it. As India pressed under Asia, sediments of the Tethys Sea were lifted up to be part of the Himalayas. With them rose many fossils, including those of Ammonites, who are now amongst the many fold treasures of these great mountains. We once thought that extinction was forever, but thanks to growing powers of biotechnology, and man's urge to play God, these treasures of old may one day be brought back to life and swim in some sea of the future! ©

THE HINDU Saturday, *August 4, 2001*

Sense & Nonsense

A social *artisan*

MADHAV GADGIL

A carpenter and a tailor, a potter and a sailor; Are a bird and a bee and other insects, you see!

A carpenter is a bee that drills in the wood, a tailor is a bird that stitches leaves, a potter is a wasp that fashions mud and a sailor is a butterfly that glides gracefully. The carpenter bees represent a transition from the solitary bees who come together only to mate to the honey bees who live in large colonies with an elaborate division of labour and a non-reproductive worker force. The mother carpenter bee stays on in her nest and continues to \' feed the larvae till they pupate.

On emerging, their young daughters join the work force and help the mother rear their younger sisters. Although the social group remains small, a carpenter bee's is thus a fully elaborated society. With its glistening black and blue colours and ear-catching hum this bee is a great favourite of Indian poets.



Countless Sanskrit verses talk of a *Bhramara's* visits to the lotus flowers which trap it when they close at the end of the day. As far as I can figure out, this is sheer poetic fancy. © *Illustration by Prema Iyer*

THE HINDU, SATURDAY, AUGUST 14, 2004

ASEAN connection

Sense & Nonsense

MADHAV GADGIL

How proudly does a buffalo
Display its sweep of horn
Warning a tiger coming too close
That its whiskers will be shorn!



Water buffaloes stand Water buffaloes stand out amongst the many social animals, sheep and goat, cattle and reindeer, horses and donkeys, which have been successfully domesticated by man. For all the rest herd together merely to hide among others of their own kind. They do not defend themselves or their brethren actively. When threatened by wolves or leopards, they simply bunch and run. Buffaloes, on the other hand, will take on even tigers. When alarmed they form a phalanx facing the predator, tucking their young in between. Their horns are formidable weapons, and it is not easy to puncture their tough hides. Moreover the domestic buffaloes are full of courage for they have diverged little from their wild ancestors. Indeed in Brahmaputra valley where they live together the wild and domesticated buffaloes readily interbreed. They were first domesticated not far from here in Southeast Asia, where they are the most valued of livestock. In fact, I would like to propose water buffaloes as fitting symbols of our ties to . the ASEAN countries. ©

THE HINDU **Saturday,** *June 15, 2002*

Sense & *Nonsense*

Big Bang

Supple, long and green,
The spiny bamboos is keen
To throw its all into seed
When the time is ripe to breed!

Bamboos are grasses masquerading as trees, with stems buried underground and branches sticking out in the air. Many grass species sprout with the rain, and seed and die en-mass as the monsoon draws to a close. Many bamboo species too enact this drama, but as befits trees, they stretch it out over decades. Thus our big spiny green bamboo devotes itself to growing vegetatively for a full 45 years, before throwing all its resources in a big bang of breeding, producing enormous quantities of seeds. Moreover, this bamboo adds a real punch to its big bang by synchronising its flowering over huge populations covering vast areas. The last time this spectacular event occurred was in 1958-62,



PREMA IYER

extending over much of the Southern Peninsula. A repea performance has just begun and should be a grand spectacle of nature as it gathers steam over the next three years. Unfortunately though stocks of bamboo have been on continual decline over the last half-century, so the show is unlikely to rise to the earlie heights. ✪

THE HINDU **Saturday, April 8, 2000**

Sense& Nonsense

Birds of good fortune

MADHAV GADGIL



White storks are smiling, At the young bride With a touch of pride You do all the work But we get the perk Ain't it a free ride!

With strikingly long legs, leeks and bills, and •landing tall as men storks have captured human imagination since ancient times. Their nests can be enormous structures, their courtship showy, their eggs ad chicks con spicuous. Some species such as the White Stork of Europe nest solitarily, others such as our Painted or Open billed Storks breed in colonies. Numbers of storks must have grown with those of people as forests gave way to farms and pastures in centuries gone by. So in many cultures these attractive birds came to be considered omens of good luck and protected and nurtured. Ramayana opens with the sage Valmiki condemning the killing of a pair of mating storks; the very name of the village Kokre-Bellur in Karnataka celebrates the ancient breeding colony of Painted Storks and Gray Pelicans that it harbours. In Central Europe White Storks are believed to deliver the babies and people welcome their nesting on house-tops, even building special platforms on wooden poles to attract. All of this testifies to the ancient bond between man and nature, a bond that gives enduring meaning to human existence. ©

THE HINDU Saturday, *October 13, 2001*



Sense & *Nonsense*

Black and *breathless*

MADHAV GADGIL

Smile of a Tarantula is
hairy and black
with shades of white
and gray;
Unlike that of its quarry
so taken aback
that it has nothing left
to say!

Hairy, black and venomous, Tarantulas are the largest of spiders, reaching a length of ten centimeters, with a leg spread of thrice as much. Most spiders prefer to spin their webs and await the arrival of their quarry.

Not so Tarantulas; out hunting at night, they love to run down their prey. But in this chase they are handicapped by their body design, adapted to the life of sit and wait predators. The respiratory system of the spiders can oxygenate blood only at a very modest rate, still quite adequate for the sedentary majority. But for the active Tarantulas this poses a problem;



Prem Iyer

they run out of breath after only a few seconds of chase.

Nonetheless, they successfully capture a whole variety of insects, and some times, even small mammals. Tarantulas are confined to the tropics; including a few Indian species. Indeed I had the privilege of encountering a new species in the Bandipur Tiger Reserve. Fortunately, the bite of none of our spiders, including Tarantulas, will badly hurt, let alone kill, a man. ®

THE HINDU **Saturday,** *June* 9, *2001*

Sense & Nonsense

Black is beautiful

MADHAV GADGIL



Donning a black suit,
panther the lithe brute,
became the talk of the town,
as cat-walk's leading clown!

Panthers, like their big brothers the tigers, come in several hues. While the unusual variants of tigers are pale, those of panthers don a dark suit. Black panthers are not uniformly jet black though, their darker rosettes show through the pale black background. Both the pale tigers and the dark pan thers are pretty rare, at most, a few per cent of the population.

Unlike in our own case, we have no idea of the conditions under which black panthers may enjoy an advantage. Among our own species darker individuals can withstand greater exposure to sun. Indeed as human interference destroys the ozone layer which cuts down sun's ultraviolet rays, paler skinned people are beginning to suffer much more from skin cancer.

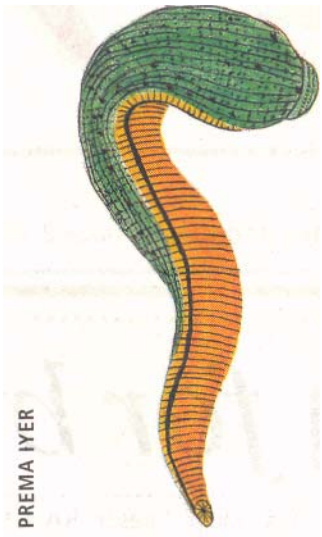
But in panthers all we can say is that the variation is a part and parcel of the immense diversity that characterises all life, and has served as the raw material for the evolution of the tremendous and till recent times increasing variety of life forms on the earth.

THE HINDU **Saturday,** *October21, 2000*

Sense & Nonsense

Bloodsuckers unsurpassed

MADHAV GADGIL


PREMA IYER

Loop, o, loop, you cunning leech,
As the ground vibes reach
The sensors and nerve ganglia preach
Your jaws and suckers to fashion a breach!

Leeches are blood sucking relatives of earthworms, abundant in tropical rain forests. I was once on a commit tee to study the impact of a dam slated to submerge a patch of the Western Ghats forest. A fellow member was a very knowledgeable engineer from Rajasthan. While I carefully avoided the bloodsuckers in the field, he never noticed a leech attracted by the vibrations created by his footfall, looping its way to lodge and fashion a breach in his armpit.

After a full blood meal, the leech let itself go, just as we sat down to a discussion on the value of the rain forest. Leeches inject into a bite an enzyme which stops blood from clotting, so that a large bloody patch formed on the spotless white shirt of my engineer friend. When I drew his attention to it, he nearly fainted for he had no clue as to what was happening. Once he understood, I had a hard time explaining how some people actually consider the habitat of such blood suckers to be truly valuable. ©

THE HINDU **Saturday,** *April 28, 2001*

Sense & Nonsense

Bold and *beautiful*

MADHAV GADGIL



PREMA IYER

Sing a song of a butterfly
black as a crow, chockful
of poison from tail to
brow; Cruising at leisure
it loves to swarm,
mingling with tigers
showing off its charm!

Crow, the butterfly, resembles in many ways the bird after which it is named. In colour its body is black and the wings a rich chocolate brown. It is the most audacious of butterflies, cruising with measured wing beats or gliding with wings held just above the horizontal plane. It has no fear of predators and will come sailing straight at you. It owes this boldness to the poisons it imbibes as a caterpillar, feeding on milkweeds, oleander, figs - all of which produce an acrid sap.

Crows have the capacity to tolerate and store the poisons from the host plant so that lizards and birds leave them alone. Crows advertise this fact at all stages of life; with shiny, gaudy caterpillars adorned by black and white rings; with lustrous golden pupae, and with the conspicuously lazy flight of adults. They form large swarms with Blue Tigers, who too are poisonous. These eye-catching, mixed swarms undertake long journeys together, though nobody really understands when and why and where. ©

THE HINDU **Saturday.** *August 23, 2003*

Sense & *Nonsense*

Bone crushers

MADHAV GADGIL



Hear the Hyena's ghostly whine
Mournful whine
"Where, where, where lies the dead body?"
In the silence of the jungle
Our fears and worries mingle
As feelings of gloom and doom readily combine!

Like wolves or, for that matter, human beings, hyenas are pack-hunting carnivores. They spend their daylight hours sleeping in burrows and caves, emerging at night to hunt jackals and antelopes, sheep and street dogs, topping off the meal with a dessert of melons. But above all, they are scavengers. Armed with strong neck, throat and jaw muscles and with teeth shaped like crushing shears, they readily break open even the big limb bones and feed on the nourishing marrow inside; marrow that accounts for two to five per cent of the victim's body weight. So hyenas take good advantage of kills by panthers and wolves, and of the innumerable natural cattle deaths. They even raid cemeteries. Indeed, it has been suggested that the tradition of topping graves with tomb-stones arose as an attempt to keep hyenas off human corpses. It is these raids on dead bodies that evoke a sense of repugnance against these remarkable beasts. But it would be better to view them as voluntary sanitation workers, specialising in recycling of bony matter!

©

THE HINDU **Saturday,** *November 13, 1999*

Sense & Nonsense

Book worm

MADHAV GADGIL

What is silver, but has little glitter? What fish wants to be out of water? What can't read, but devours paper? What insect won't fly, but rather scamper? The silver fish!

Silver fish are flat little wing less insects covered in glistening scales. We see them in our houses scurrying around old books or yellowed newspa pers, or in the kitchen among onions and potatoes. They exhibit signs of being rather primitive, not yet fully adapted to existence on land. Their worm-like ancestors reproduced by merely releasing eggs and sperm in waters; fully evolved insects mate with the female receiving the sperm that are stored in a special sperm sac, fertilizing the eggs one by one. Silver fish are halfway in between. During their courtship the male engages in a lively and varied dance, frequently touch ing the female. It then spins a few threads between two bumps on the ground, depositing under them a capsule loaded with sperm. When the belly of the dancing female touches the threads she stops in her tracks, and searches for the sperm pack-



et with her lowered abdomen. On reaching it, she picks it up and takes it in to fertilize the eggs. That is how evolution has pro ceeded not in fits and starts, but in small, incremental steps. ©

THE HINDU, Saturday, Junel9,1999

Bully birds

Rose-Coloured starling A rose-coloured starling, Said, o my darling. Come, let us hector, The flower's full of nectar!

ONE of the loveliest sights of the Indian countryside is a flame of the forest, a red silk cotton, or a coral tree covered from head to foot with red, orange, crimson blossoms. Soon after the rains these trees shed all their leaves, and then as the cold season ends they burst forth in spectacular blooms. Their reddish hue has evolved to attract birds, and each separate flower is a flowing bowl of liquor as delicious to a discerning bird as Kingfisher beer to a Bangalorean. Every tree is a scene of revelry and riot The ubiquitous crows are there of course, and drongos and coppersmiths and mynas, and here and there a squirrel. But the rowdiest of them all are the jolly flocks of rose-coloured starlings or rosy pastors. The pastors behave like blustering bullies keeping other birds away from flowers. They droop, twitch and shiver their wings, spreading and flicking their tail, screaming chit-chit-chit as they charge newcomers!



Sense & Nonsense

Their other food includes insects, and in parts of Central Asia they are revered for destroying locusts. In Iran there is a belief that anyone afflicted from locust plague must break in their midst a pot of water from a certain sacred well; and the pastors will come and polish off the pests.

MADHAV GADGIL

THE HINDU **Saturday,** *March 31, 2001*

Sense & Nonsense

Claws, jaws and stings

MADHAV GADGIL

The black and orange centipede is apt to impede, The spring in your stride with its claws in your hide!

Centipedes are among the more poisonous relatives of insects and crabs. This great clan of Arthropods dominates the animal kingdom with numbers and diversity unmatched by any other group. Amongst the ingredients of success of the Arthropods is the versatility of their defences and offences. Many pack venoms for one or both of these purposes, at either the front or rear ends.

Ants, spiders and centipedes bear poison jaws and claws; bees, wasps and scorpions poison stings. The venom is generally a cocktail of a variety of molecules, small ones like formic acid or amines, large ones like proteins.

The centipede's venom is a mixture of enzymes that help digest the quarry and proteins that set the victim's heart palpitating and an amine, serotonin. Serotonin is a chemical messenger engaged in transmission of signals amongst nerves. In humans its excess leads to anxiety, its deficiency to depression. No doubt the prey or the enemy of a centipede gets quite a nervous shock as the centipede's poison claws inject into its body a hefty dose of serotonin! ©

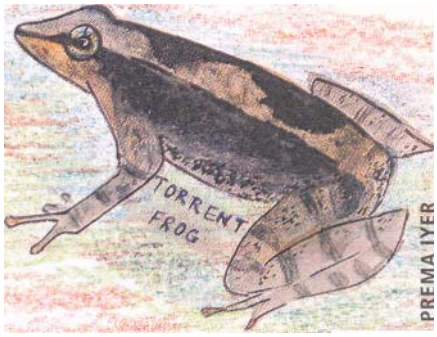


THE HINDU **Saturday,** *December 1, 2001*

Sense & *Nonsense*

Close-knit clans

MADHAVGADGIL



How slickly doth the torrent frog round up his slimy clan; To meet and greet in a forest bog they're all in his tinkling span!

Torrent frogs are *pukka* South Indians, with all seven species confined to south Western Ghats. All of them are tiny, between one to five centimetres in size, hopping around hill streams or on damp forest floor. The humid Ghats forests that are their home are cut off from the much larger tract of such forests running through northeastern India and southeastern Asia. Given the limited mobility of frogs, this isolation has led to the evolution of a large number of species confined to the Western Ghats. A species is defined in terms of all its members being potentially capable of mating with an individual of the opposite sex. Thus all humans are a single species with members dispersed across the whole earth. Some frog species are at the other extreme, with the entire population confined to a narrow tract, as is the case with the Silent Valley Torrent Frog. Come mon soon, males of these species would enjoy the good fortune of having all of their potential mates almost within the range of their tinkling call. ©

Sense & Nonsense

Closing the circle

MADHAV GADGIL



Prema Iyer

What a pleasure to meet pill millepede
whose shape is rounder than a ball;
This creature was surely designed to roll, rather than crawl!

Millepedes are the many-many legged cousins of insects, spiders and mites. This diverse clan accounts for the bulk of animal matter wherever life thrives on land. Life everywhere is engaged in acting out the cosmic drama of renewal, growth and destruction, where renewal of one depends on destruction of another, and growth of one is essential for the renewal of another.

Thus goes life in a circle beginning with growth of green plants soaking up soil nutrients and sunlight; their destruction supports the growth of herbivores like grasshoppers who in turn must be sacrificed if birds are to sing and breed. This circle must be closed by returning the nutrients contained in dead plant and animal matter to the soil. The lowly animals, moulds and microbes who perform this function are little noticed, but without them life would grind to a halt. Prominent among such decomposers are millipedes, who along with earthworms are the great builders of soil. But for these meek creatures, there would be no earth for the not so meek mankind to inherit! ©

Sense & Nonsense

Coats of silk and sand

MADHAV GADGIL

A caddis fly
Is snug and spry,
And full of grace
In its silken case!

Caddis flies, relatives of silkworm and other moths and butterflies, put their silk to very many different uses. Their larvae are all aquatic, living on stream and lake bottoms, even in saline estuaries and tidal pools. Larvae of some species inhabiting fast flowing waters anchor themselves to a rock with a silken dread. Others use it to construct protective cases sticking a variety of





objects, pebbles and grains of sand, algae and diatoms and pieces of detritus on to the silken base. Thus secured they move around leisurely scraping off algal growth, ingesting detritus. Yet others capture food particles from currents by the aid of specially constructed silk nets. The larvae transform themselves into winged adults during the pupal stage, ensconced within silken cases. The bodies and wings of I the rather drab and dusk loving adult caddis flies are covered by fine hair, and in a few cases scales. But it is these hair that are transformed into the many splendoured colourful scales on the wings of their kin, moths and butterflies. ©

THE HINDU **Saturday,** *May 20, 2000*



Sense & Nonsense

Colourful *cheats*

MADHAV GADGIL

Oh Titli! the butterflies pose
Most funnily, I swear,
For an Eggfly is a Tiger, one would fear,
And a Mormon a Crimson Rose!

Some of the most attractive butterflies owe their charm to their attempts to baffle predators. Such are the Plain Tiger, and its mimic, Danaid Eggfly or the Crimson Rose and its mimic, Common Mormon. Reproduced here is a classic painting of the Plain Tiger by Muhammed Nadir, an artist in Mughal Emperor Jahangir's court. Birds learn to shun the Tigers and Roses for they accumulate in their bodies toxins produced by plants to discourage browsing by insects. Caterpillars of these species have evolved an ability to tolerate and accumulate these poisons. As a result the adults are unpalatable to birds and to make sure that birds do not attack them by mistake they have evolved a striking appearance and a slow deliberate flight.

There is a further twist to this story, for some palatable butterflies like Danaid Eggfly or Common Mormon who lack the toxins have evolved to resemble the poisonous models, and thereby fool birds. The models and mimics are difficult to distinguish at a glance but for the fact that when pursued the mimics abandon their imitation of the leisurely flight of the poisonous models and briskly take off like other palatable butterflies.©

THE HINDU **Saturday,** *October 27,* 2001

Sense & Nonsense
Cool and *bright*

MADHAV GADGIL



Twinkle, twinkle, Firefly, How you fill my heart with joy! With little stars all flashing by, Feel am floating in the sky!

Just as dusk settles, fireflies set alight wooded tracts all over India in early months of the rainy season. Their . tiny cool lights are a ? model of efficiency; converting into light fully 95 L per cent of the energy used up. Compare this to an ordinary bulb which loses 90 per cent of the electrical energy as heat. Fireflies owe this remarkable efficiency to the relentless pressures of evolutionary forces, pushing all organisms to become ever more effective devices of survival and reproduction. In its quest for efficiency, life has evolved its own special way of producing light, through conversion of a chemical, luciferin to oxyluciferin, catalyzed by an enzyme, luciferase, in the presence of oxygen. The light serves to bring the mobile males to the sedentary females sitting on sticks of grass or twigs of shrubs. Each of the thousand odd species of the firefly clan has its own species-specific patterns of light flashes to ensure that there are no mis-matches amongst the lovers. As is so often the case, in fireflies too, beauty is born in service of love. ©

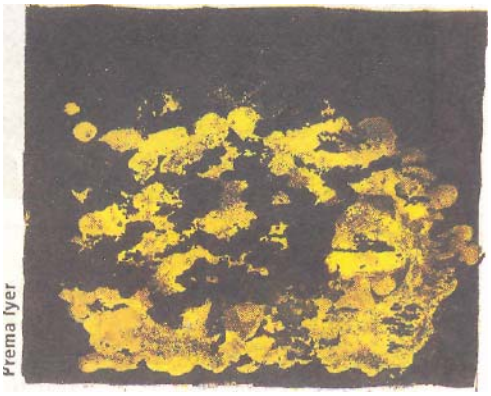
THE HINDU **Saturday,** *March 27, 2004*

Sense & Nonsense

Cradle of life

MADHAV GADGIL

Chemolithautotrophic hyperthermophile
On volcanic sea bottom was earliest of life,
To be born so early was downright precocious
And that too in such a place was utterly audacious!


Prema Iyer

Life, would you believe, was born in the dark depths of oceans, in waters brought to boil by molten rock seeping out through huge fissures on the sea bottom, in waters utterly devoid of oxygen, and laced with hydrogen sulphide, a gas that famously smells of rotting eggs!

It indeed, received a baptism of fire and brimstone, for brimstone means sulphur, and the outpourings on the underbelly of the ocean are full of sulphur, these earliest of organisms met their energy needs by combining hydrogen sulphide with carbon dioxide to form simple organic compounds. The present day green plants manufacture sugars in a similar fashion by combining water, which is nothing but hydrogen oxide with carbon dioxide. But that requires more sophisticated chemical machinery that took ages to evolve. Conditions of life have changed dramatically over much of the earth since its origin three hundred and eighty crores of years ago. But life still thrives on sea bottom volcanoes, supporting bacteria that are fond of very high temperatures — hyperthermophiles and are Chemolithautotrophic — use the chemical energy of rocks. Life indeed was born and still prospers in hell! ®

THE HINDU **Saturday,** *September 6, 2003*

Sense & Nonsense

Creeping on to land

MADHAV GADGIL

Small, flat and wet, the liverworts
Seem creatures far from grand,
Yet these humble plants led the way
For the conquest of the land!



They look insignificant; flimsy pieces of green tissue clinging to patches of wet ground. But, in reality, liverworts are great innovators of body design, and earliest of conquerors of dry land. Their ancestors were green algae, single cells or, at may be readily absorbed. But on land large surfaces mean unacceptable levels of water losses. So liverworts evolved a compact, flat body form. More importantly, their cells diversified, with those on the upper surface fortified to reduce water loss and those on the lower surface sprouting hair-like projections to help absorb water. But without specialised pipes to conduct water and nutrients, which must diffuse from cell to cell, these primitive plants are forced to remain small in size. Moreover their sperm cells need to swim through water to fertilise the egg cells, so liverworts remain confined to more humid niches. Yet these humble creatures have taken a giant stride for the whole living kingdom. ©

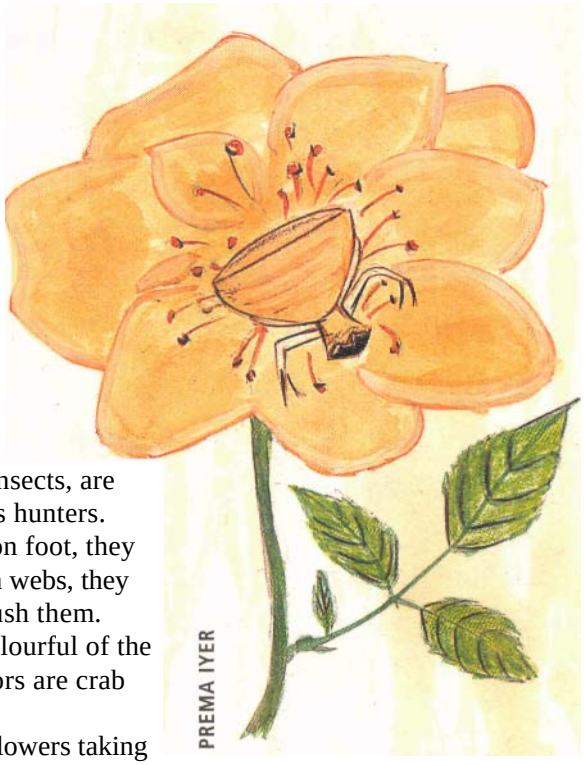
THE HINDU, Saturday, August 26, 2000

Sense & *Nonsense*

Deadly *blooms*

MADHAV GADGIL

Smile of a crab spider is
flowery and gay
With promises of pollen and honey,
Like that of a trickster who invites you to play
And relieves you of all your money!


PREMA IYER

Spiders, the eight legged relatives of insects, are their most relentless hunters. They pursue them on foot, they snare them in silken webs, they lie in wait and ambush them. Among the most colourful of the sit-and-wait predators are crab spiders.

They blend with flowers taking on white, cream, yellow, pink colours, patiently waiting for victims in search of a drink of nectar. The spiders pose with their two rear legs anchored, with the middle ones folded in imitation of petals, and forelegs spread in an expansive welcome.

The moment a gullible guest lands nearby, it is enveloped in a tight embrace, and greeted with a love bite on the neck that pumps the venom directly on to the nerve chord.

The paralysed prey, typically a soft and succulent fly, is then leisurely sucked dry before the empty shell is cast off. Satiated, the spider slides sideways in a crab-like gait to take station on another flower. ©

THE HINDU Saturday, *July 13, 2002*

Sense & Nonsense

Devout fathers

MADHAV GADGIL



A pheasant tailed Jacana Of the gender femina Gifts lots of chicks To each boy friend she picks!

In the breeding season, peacocks and many other male birds don fine feathers to strut before their mates, who retain their normal, inconspicuous plumage. But there are striking exceptions, one of the most notable being that of the Pheasant-tailed Jacana. Its dull brown and white dress allows it to blend perfectly with the drying lily pads of a village pond during the non-breeding season. But come monsoon, both the sexes are transformed into strikingly handsome white and chocolate brown, black and golden yellow creatures with a long sickle-shaped tail. If anything, the female looks more spectacular, being bigger in size than her mate. Over the breeding season she does a round of boyfriends, gifting each with a clutch of eggs, before moving on to fresh pastures.

Meanwhile the males incubate the eggs and then feed and protect the chicks, perchance to welcome their old girl friend back after the young have left to lay yet another clutch for them to look after. At least this one bird species has utterly banished male chauvinism! ©

THE HINDU **Saturday,** *July 19, 2003*

Sense & Nonsense

Did you do it?

MADHAV GADGIL



Prema Iyer

Listen to Lapwing's raucous note,
Brazen note!
Did he do it? Did you do it?
Pity to do it!
In the silence of the night
How we shiver with affright
At the melancholy menace of its tone!

The long-legged Red-wattled Lapwings love open, rock-strewn country, so long as there is some water nearby. They are a little drowsy during the day, but feed actively at dusk and dawn, and throughout moonlit nights. Their nest is a scraping on open ground; with superbly camouflaged eggs and chicks. On being alarmed the parents utter a soft "pit" command to which the chicks respond by a series of "clucks" signalling all clear. In the meanwhile, the adults slink away from the nest, and commence noisy demonstrations, screeching their notorious "did you do it, pity-to-do-it" calls. As the birds tend to be up and about at nights, we are often startled by their cries in the middle of our sleep. These sound ominous, and there is a belief that their flying overhead screaming at night, foretells a human death. In reality, all that the Lapwings are trying to do is to distract a predator's attention to forestall a death in their own family! ©

Sense & Nonsense

Do they still fly?



Far and few, far and few Are the hills Where mountain quails flew:
whether they fly still,
Or are gone forever
Nobody has a clue!

CHANGE is the rule, constancy an anomaly on this earth. Life is in constant flux, with old forms giving way to the new. The extinction of species is then a part of evolutionary play; for every survivor, as many as 20 might have to quit forever.

But some periods in geological history have been notable for the much faster pace of extinctions; one such was 65 million years ago, when the dinosaurs made their exit. Some scientists contend that this is an incorrect statement; dinosaurs did not really disappear, for birds and crocodiles are, in reality, living dinosaurs. Be that as it may, it is well to remind ourselves that the current rates of extinction greatly surpass the rates that prevailed when the dinosaurs were wiped out.

One of the living dinosaurs -a bird, that seems to have gone extinct in this ongoing spasm is the mountain quail. Just a handful of this red-billed, red-legged brown bird were collected around Dehra Dun, Mussoorie and Nainital between 1846 and 1876. It is possible that some of these quails still live on the steep rugged hillsides of Uttarakhand; but in spite of many efforts none have been located by the late Salim Ali and other bird watchers.

MADHAV GADGIL

THE HINDU, Saturday, June 5, 1999

THE HINDU, Saturday, July 3,1999

Doin' fine, Uncle Dino

Gharial

How *doth the gharial*
Swish her slender tail,
And churn waters ofChambal
Over every shiny scale!
How cheerful is her grin,
As she waves her handsome claws,
And invites little fishes in
Her gently smiling jaws!

GHARIAL, along with marsh and estuarine crocodiles are among the three largest animals of our country. The gharial is the longest of all, reaching eight metres. These fascinating creatures are close relatives of dinosaurs, and the fact that they are with us goes against one of the proposed explanations of why dinosaurs went extinct 65 million years ago. Crocodiles, lizards and turtles exhibit, while dinosaurs might have possessed, temperature-dependent sex determination. Eggs of these animals exposed to warmer temperatures develop into the larger sized sex, female in case of turtles, and just the reverse in case of crocodiles and lizards. If global cooling was a cause for extinction of dinosaurs then it may have acted through creating an all-male - or all-female population. But we know that crocodiles and turtles hardly suffered along with dinosaurs, and lizards did only mildly. Therefore some other mechanism must have driven dinosaurs to extinction, as human destruction of habitats is affecting crocodiles today. The most threatened of them all is Gharial, holding out as best as it can in a sanctuary along Chambal river.

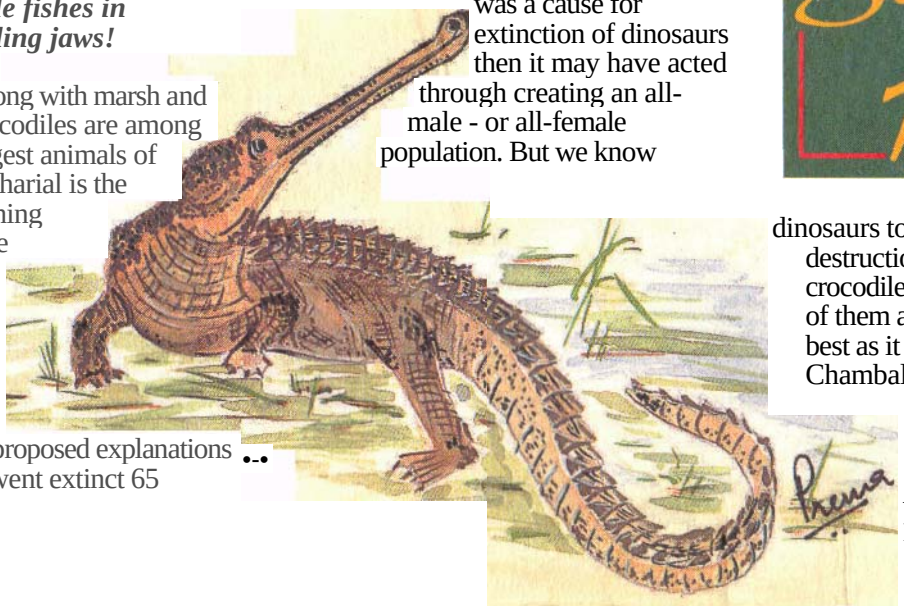


Illustration by Prema Iyer

MADHAVGADGIL

THE HINDU **Saturday,** *February 3, 2001*

Sense & Nonsense

Don't kick, bite

MADHAV GADGIL



Prema Iyer

Don't Kick, Bite! If you grab, this brave crab Forcing her to walk straight You will suffer a bite, which serves you right For spoiling her crooked gait! You have crabs wherever there is water. Scampering sideways across rocks, burrowing with a flurry in sand, striding the mud in deep waters, even swimming in the open, they abound in the seas. Originating in salty waters, they have invaded the rivers and streams and even come out on land, as does this denizen of our West Ghats. But crabs need water to take up oxygen, for they breathe with the help of gills attached to their legs and jaws. When in air they retain a thin film of water that is kept moving over the gills and the undersides by a pair of special flaps up front. But it is not enough to breathe, they must also fight off the birds and mammals that are after them. To this end crabs have converted the first out of their five pairs of legs into pincers that can deliver a nasty bite. A coral crab goes one better, whenever threatened it picks a sea anemone that is well equipped with stinging cells and thrusts it at the predator! ©

THE HINDU *Saturday, March 17, 2001*

Sense & *Nonsense*

Dressed to *deceive*

MADHAV GADGIL

Should one wipe
the eye-brow stripe
of a Pintail Snipe?
One should rather
stripe it over
like a tiger!



Prema Iyer

Snipes are masters of the vanishing trick. Rapidly flying in a zig-zag fashion, they suddenly drop down amidst reeds of a marsh or a paddy field and simply disappear from sight. These birds employ pretty much every trick known to animals to accomplish this camouflage.

Their dark brown and warm buff colours match the play of light and shade on the rotting leaves and drying stems amidst which they dwell. Their under-parts are a dirty white, countering the effect of their shadows. Their stripes and stipples disrupt the outline making it difficult to discern their shape. Their glistening black eyes are surrounded by black and buff stripes giving a three dimensional effect. The resultant planes at different angles blend with curled and scattered leaves and blades of grass.

Utterly confident, they wait almost till one steps on them to take off with a rush and a whirr, changing directions at a fast clip, before deciding to execute a nose dive to blend once again with the broken background. ✪

Sense & Nonsense

Dwarfing the giants

MADHAVGADGIL

If in the dense woods they
wish to advance
Lianas, their stature must enhance,
They must stretch and clasp
And grasp like a rasp .
Or else they
haven't got a chance!

Light is the most precious commodity for plants jostling with each other in the exuberance of growth in a tropical rain forest. They adopt a variety of strategies to get to soak up the sun. Many invest in tall trunks. Others, like orchids set up house in the tree crowns, scrounging up nourishment from the decaying organic matter collected in the cracks of barks. A third strategy, that of lianas or woody ^climbers is to begin with roots firmly in the soil, but out-top biggest of the trees without investing -j-in a thick stem. Having arrived at the top of the canopy, lianas spread out, often over hundreds of metres. But this needs patience, for their seedlings must endure shade for a long time before they reach the summit. Entada, a common sight in the wet forests of Western Ghats, manages this with the help of huge seeds borne in pods that rival thick curved swords in their size. This colossal climber is indeed a personification of the maxim that patience is the mother of all virtues! ©



THE **HINDU** **Saturday,** *February 14, 2004*

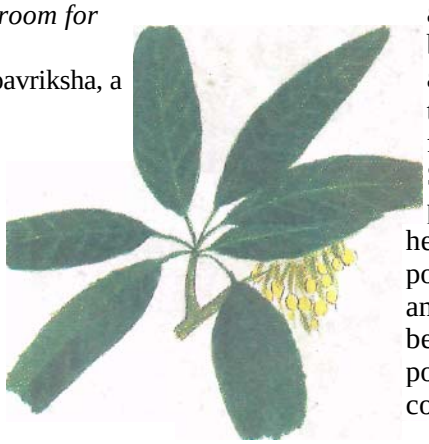
Sense & Nonsense

Eat, brew and be merry

MADHAVGADGIL

Time has come, the fruit bat felt
To eat some Mahua bloom, To
get a little high, and be sure
There is no room for gloom!

Mahua is a Kalpavriksha, a tree of abundance whose every part is of service for the people of Central India. This most handsome tree with its rounded crown is found everywhere along farm bunds and habitations as well as in the natural forest in India's tribal heartland, for people have maintained it with great love over millennia. The rind of the fruit is consumed like a vegetable, and the seed provides edible oil. Most notable of all are its flowers with fleshy petals loaded with sugar. The smell of the fermenting petals carpeting the ground attracts deer and bear that feed avidly on them. But that is of no avail for the Mahua tree. Surely, the sweet petals must be helping attract some pollinating agents, and I suspect these to be bats. Bats pollinate -many of our common plants such as banana and mango and are rewarded with nectar. Mahua apparently feeds them on sweet petals. People, too, enjoy eating the petals, and even more so, fermenting them to brew a most popular liquor. ©



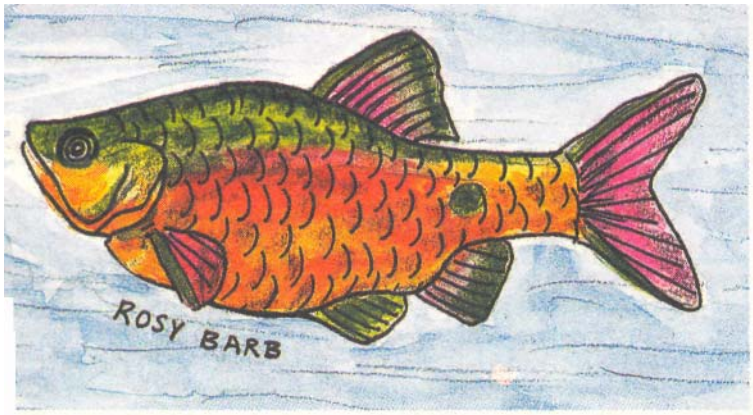
Prema Iyer

THE HINDU **Saturday,** *September 29, 2001*

Sense *& Nonsense*

Ever- *pink*

MADHAV GADGIL



Prema Iyer

Rosy Barbs are learning to swim in a glossy cage and not work up a rage; Though all that meets one's gaze is one's spitting image!

Rosy Barb is a lively little fish of our streams; it is also a popular aquarium fish. There is a notable difference in the colours of the fish in natural waters and those in aquaria. In their glassy cages, not just the males but their girl friends too have an attractive rosy tint; in the wild just the males possess the reddish hue, and that too only during the breeding season. After all, bright colours attract attention, with attendant risks of predation. So forces of natural selection ensure that the eye-catching colours are confined to the sex and season where they play a role; in this case help males attract mates. Under a regime of artificial selection we have deliberately bred ever-pink individuals of both the sexes. For natural populations, this means a welcome escape from pressure of capture by the aquarium trade. Unfortunately, along with other denizens of fresh waters, they still suffer from many other threats; pollution, damming and dynamiting, to mention just the more prominent ones. ©

THE HINDU **Saturday,** *July 15, 2000*

Sense & Nonsense

Faithful *forester*

MADHAV GADGIL



A whitebellied blue flycatcher Loves the dark interior, Of a wet canopied forest Where it is at peace and rest!

Poet Kalidasa likens the hills of Western Ghats to a pretty damsel. Her head lies towards Kanyakumari, her feet braced against Satpura hills. She wears a green sari of verdant rain forests. Whitebellied blue flycatchers would be an apt motif with which to embroider this garment. For more than any other, this bird is characteristic of the rain forests of Western Ghats.

Others such as the Nilgiri flycatcher and rufous breasted laughing thrush are also restricted in their range; but they are birds of the high hills, not denizens of true rain forest. The rufous babbler and Malabar whistling thrush too are limited to Western Ghats and love the rain forest. But they are not so faithful as our hero and venture into other types of vegetation.

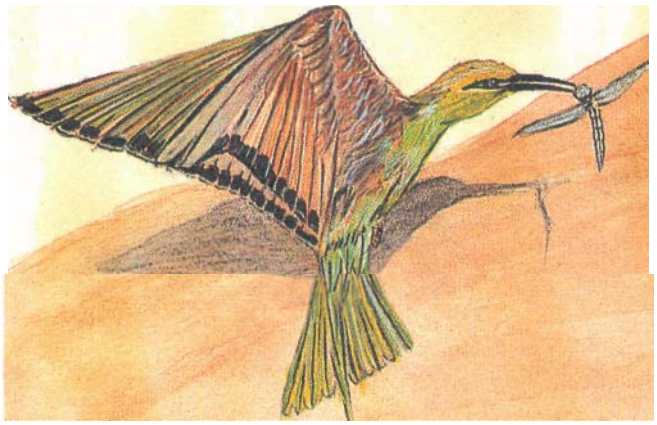
The honour of being the most loyal of Western Ghats rainforest birds goes to the white bellied blue flycatcher which sticks to the interior of large patches of wet forest. I often dream of following in its footsteps.®

THE HINDU **Saturday,** *August 12, 2000*

Sense & Nonsense

Family business

MADHAV GADGIL



Sing a song of bee-eaters father and son
Mom and little sisters all full of fun,
As the chicks grow up and take to the wing
The jolly clan will sally forth and merrily begin to tring!

Bee-eaters are sleek little grass-green birds with a coppery sheen. Their call is a pleasant trill; tree., tree., tree., tring. tring.. tring. Whenever and whereever you meet them, they are full of good cheer. Indeed they seem so fond of each other's company, that they hunt insects during the day in small parties, and at night congregate in hundreds to sleep together. They breed in colonies, usually on a steep river bank.

As many as 40 per cent of the nests of the little green bee-eaters of India have an additional helper assisting the pair in their parental duties. Chicks in nests with such helpers grow faster and stand a better chance of survival. The helpers turn out to be elder brothers and sisters. They may not always be willing helpers, though.

In an African species, for instance, it has been shown that fathers deliberately disrupt the nesting attempts of their sons, urging them to get back home and help dad and mom raise some more siblings. Cheerfully, lots of the young chaps seem to agree.

Illustration by Prema Iyer

©

THE HINDU **Saturday,** *July 27, 2002*

Sense *& Nonsense*

Fatal semblance

MADHAV GADGIL



What looks like a worm, but ain't spineless?
What slithers like a snake, but is fangless?
What breathes like a frog, but is limbless?
A caecilian, that's my guess!

When fishes walked out of water on to mud 400 million years ago, they gave rise to the amphibians — animals both of land and water. There are three major clans of amphibians — the salamanders, largely confined to the countries of the north, possess both a tail and four £ limbs. The cosmopolitan frogs and toad, have no tail but four legs. The third clan, that of caecilians, is limb-less and pretty much tail-less. It is also ear-less and mostly eye-less.

These creatures of the humid tropics look for all the world like giant earthworms; with one or more rings corresponding to each vertebra. Several species are characteristic of the Western Ghats, thriving in the humus rich soils of the betelnut orchards. Here, like the earthworms, they lead most of their lives buried underground, feeding on worms, insects, even snakes. Unfortunately, for the caecilians, they move much like snakes, with sinuous undulations of the body. So people, knowing little of these secretive animals, conclude that they too are poisonous, and kill them. Superficial resemblance can indeed be a serious liability! ©

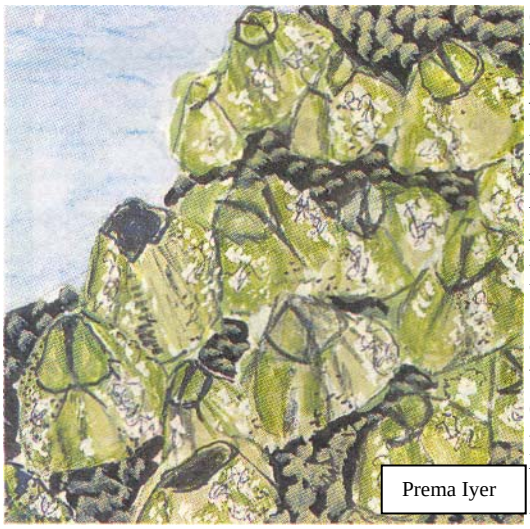
Illustration by Prema Iyer

THE HINDU **Saturday,** *January 11, 2003*

Sense & *Nonsense*

Firm as a rock

MADHAV GADGIL



Prema Iyer

Behold the barnacle, Whose mouth's in a circle, Round the clock It's stuck to a rock!

Panthers stalk their prey, wolves run it down, spiders wait for the quarry to get entrapped. But acorn barnacles are the ultimate sit-and-wait predators, cementing themselves firmly to a rock and waiting for water currents to bring their food to them. Relatives of crabs and shrimp, barnacles are encased in a conical armour with a circular opening on the top. Waving their many legs, they guide water currents towards the mouth, where fine comb-like processes gather the tiny animals that make up their food. They eat well, for they park themselves in the inter-tidal zone, where the water is in perpetual turmoil, swishing back and forth with the rise and fall of the tides, all the time bringing in newer and newer supplies of food.

There is no free lunch, though, and to inhabit this zone, the barnacles have had to give up their mobility. This raises its own problems of finding a mate. Barnacles have a simple solution; all of them are at once males as well as females! ©

THE HINDU **Saturday,** *January 1, 2000*

Fish *out of water*

MADHAV GADGIL

Sense & Nonsense

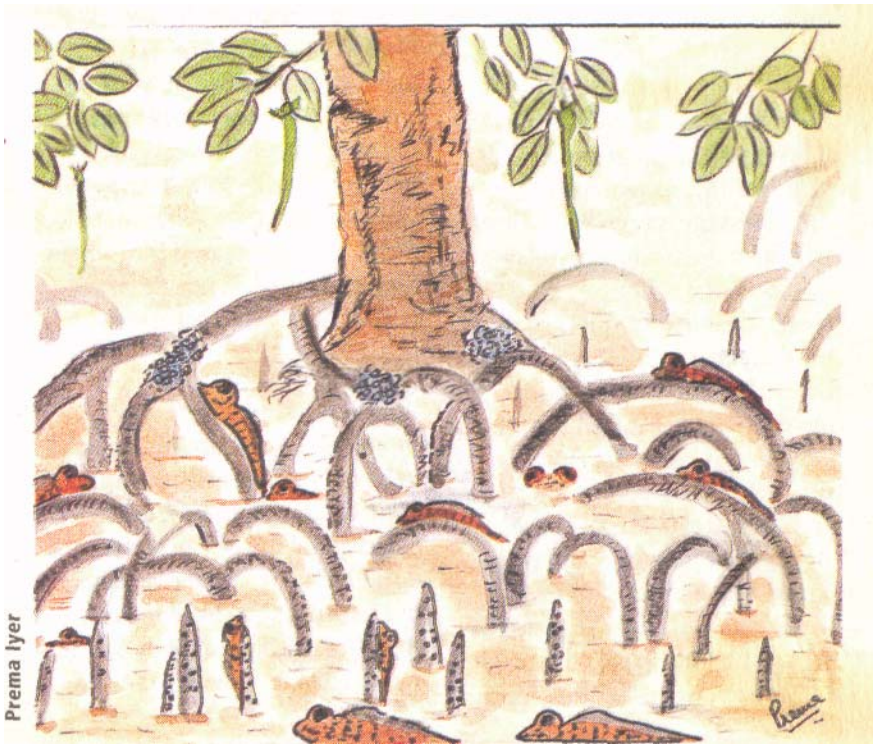
Would you prefer,
a mudskipper
to hop, skip and jump?
Or would you rather,
that it slur
and slip, slide and bump!

A mudskipper is literally a fish out of water. Its haunts are muddy banks of estuaries where rivers meet the sea, mingling fresh water with salt.

There it lives among the mangrove trees, taking a dip now and then to keep its gills wet enough to continue to breathe in the fashion of a fish. Its forefins have grown muscular to enable it to hop about snapping insects and little crabs.

Everywhere else on muddy shores, it would be frogs that would be engaged in such antics. But frogs are intolerant of salt and cannot colonise estuaries.

The little insects and crabs of mangrove swamps, therefore, have no regular predators. So nature prompted gobbles that live on the bottom in shallow seas and streams to evolve ways to get out of water, on to the mud and devour them. That is the origin of this tribe of quaint little fish, the mudskippers.®



Prema Iyer

THE HINDU **Saturday,** *March 15, 2003*

Sense & *Nonsense*

Fishing in troubled waters

MADHAV GADGIL



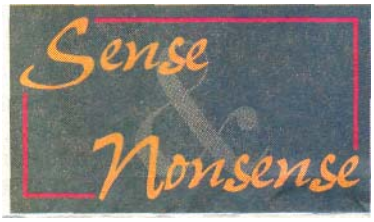
Would you prefer A
kingfisher To flutter
and hover? Or do you
wish To see it swish
And spear a fish?

With their compact bodies, large heads and prominent beaks, kingfishers cut a striking figure. All of them are brightly coloured, some in glistening chestnuts and blues, others in more sober silver and black. They come in two body forms; with a short, square cut tail, or a longer, stiff one. The square-tailed ones like to net their game by diving into water from some vantage point. Those with the longer tail, such as the handsome, white black Pied Kingfisher prefer to cruise over the water. On sighting its quarry the bird checks itself dead in mid-air, hovering with the bill pointing downwards, before taking a plunge. Jerdon, the 19th Century pioneer of Indian ornithology, says that he never saw one dive into the water and come out without a fish. Alas, this is no longer true. So this lovely bird is becoming less and less of a common sight, even as the waters are taking on the hues of the beer whose bottles so proudly display one of its more gaudily coloured relatives! ©

THE HINDU, Friday, January 15 ,1999

Flashing lanterns

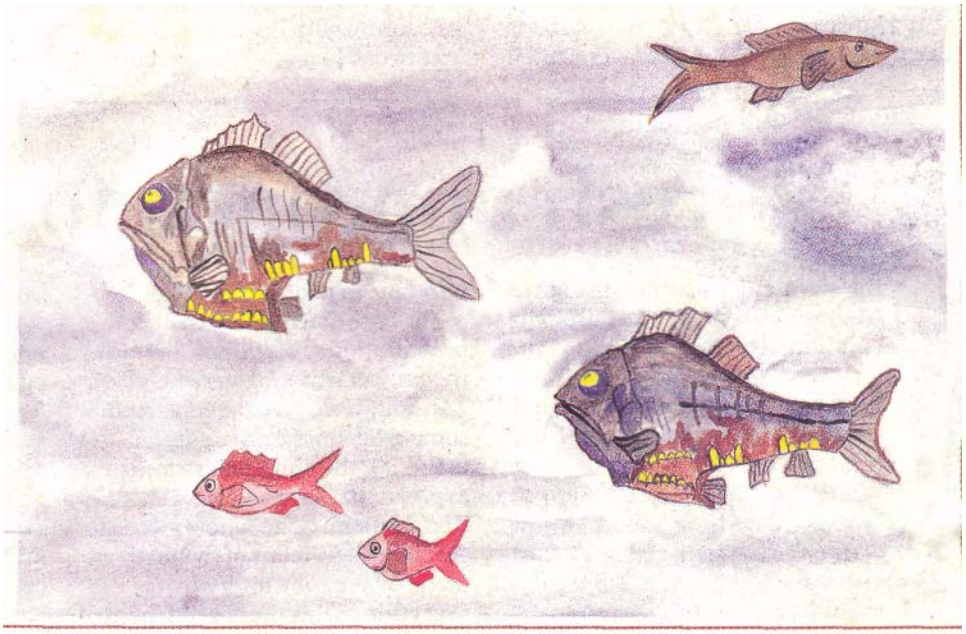
In *the deep dark waters of Atlantis*
Live myriads of hatchet fish.
With lanterns flashing yn their flanks,
They swim about in luminous ranks



HATCHET fish with their compressed silvery bodies and wide mouths are among the commonest denizens of the dark waters of not only the Atlantic, but also the Pacific and Indian Oceans as well. They gaze at the waters above with their tubular upturned eyes, recognising fellow fish by patterns of light organs flanking lower margins of their bellies During the day they stay below 4OO metres, at night moving up to 100 metres in depth. Worldwide, there are 12 species of hatchet fish, all around five Between themselves they constitute a very significant item in the diet of the great predatory fishes of the open ocean, sharks and tunas.

Illustration: ***Shubha Sunder***

MADHAV GADGIL



THE HINDU **Friday,** *October 6, 2000*

Sense & Nonsense

Flashy dragon

MADHAV GADGIL

How merrily doth the lizard spread its yellow flaps; How smoothly doth it sail across the forest gaps!



PREMA IYER

Draco, the flying dragon, is a close relative of the garden lizard. It is at home in the Western Ghats forests, creeping up tree trunks, devouring ants. Its ashy grey colour broken by black circles blends perfectly with the bark, so that it is well nigh impossible to detect as it climbs higher and higher on a tree. But once close to the summit it suddenly transforms itself into a yellow butterfly that floats down to a tree nearby.

As it strikes the tree with a distinct plop, the yellow underside of its wing membranes is hidden from the view. So that the creature disappears all of a sudden. This is an example of its use of flash colouration to enhance camouflage. It is inevitable that the lizard will be noticed as it glides from tree to tree. So it resorts to dramatically changing its appearance the moment the glide is concluded, thereby rendering it impossible for the predator to continue keeping it in view. ©

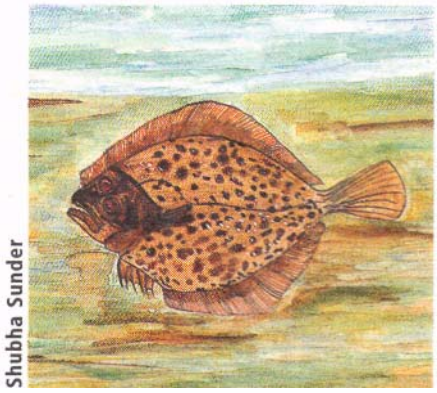
THE HINDU **Saturday,** *November 27, 1999*

Sense & Nonsense

Flat and *frugal*

MADHAV GADGIL

Who, why or what,
Is the fish turbot?
Is it tall or short, long or slim?
Is it thin or flabby, flat or trim?
Oh just flat,
The left-eyed turbot!



Shubha Sunder

Turbot is one of the flat fish es that lie on the bottom of the sea, blending miracu lously with sand and mud, patiently waiting for a fish or a prawn to wander into their mouths. They look funny, being flattened from side to side, with the right side assuming the role of the belly, and left the upper side. Since both the eyes and the mouth must be on top, the head is all twisted up conferring on the fish a permanent grin. The upper side is loaded with pigment cells, and the turbot adjusts its size so well that it matches perfectly with the sandy or muddy bottom. But the right or underside is always hidden, and has no pig ment cells at all. After all, produc ing the pigment needs energy. So that side is pale white, as are all creatures who live in permanent darkness of deep caves. The cave dwellers lack eyesight as well, although their close relatives out in the open have perfectly good eyes and normally pigment-ed skins. Frugal indeed are ways of nature!®

Flightless birds



Rhea, cassowary are birds of ostrich ilk,
Their wings can't fly but their legs can kick!
Pretty natty are theses dames of emu clan,
If put in a troupe, they will dance a can-can!

RHEA, ostrich, cassowary, and emu are all large flightless birds, with rudimentary wings, but straight, strong legs. They all live south of the equator, as did the even bigger flightless birds, the elephant bird of Madagascar and Moa of New Zealand that were exterminated a few centuries ago. It is a notable fact that the lands south of equator harbour some of the most distinctive forms of life. The only egg-laying mammals, and most marsupials like kangaroo occur in the South, as do giraffes, chimpanzees and gorillas. The south owes this wealth to the fact that its land is broken up into many widely separated continents and islands, while the north has just three large landmasses and even these are pretty much connected. It seems isolation breeds diversity!

Illustration by Shuba Sunder
MADHAVGADGIL

THE HINDU, Saturday, August 14, 1999

Flower power

Sense *& Nonsense*

MADHAV GADGIL

The smell of Night Jasmine is sweet and fresh
And reminds one of hills and snow;
Like the smile of a lass with ruby lips
And snow white teeth in a row!

Just as the dawn breaks, they drop one by one, forming a carpet of snow-white petals topped by ruby stalks; an enchanting sight common to the court-yards of countless Indian houses. Picked up early in the morning, the sweet-scented flowers of Night Jasmine end up adorning the gods. This combination of white colour, fragrance and the habit of blooming at night characterises many of our flowering plants. Such plants depend for pollination on night flying insects, so abundant in the tropics. So we have moved many of them from nature into the precincts of our gardens and temples.



Prema Iyer

The Night Jasmine, a small tree, occurs in the wild in the Himalayan foothills and in the terais; today it is cultivated all over India and in many of our neighbouring countries as well. The true Jasmines, all shrubs or climbers, also occur in our forests, from where they have been moved to the gardens and thence into the braids of the women. After all, Indians practised aroma-therapy for millennia before it became fashionable in the West. @

THE HINDU **Saturday,** *February 1, 2003*

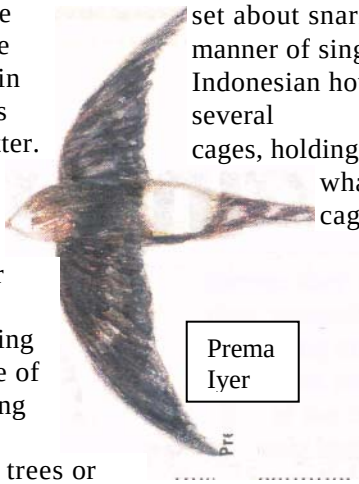


Sense & *Nonsense* Fly for your life

MADHAV GADGIL

Be a Swift, and stay on the wing,
For heaven's sake, don't sit and sing.
For then you can be sure of your fate,
Locked in a cage, or served on a plate!

An eerie silence prevails as the dawn breaks in Indonesia. No koels call, no mynas chatter. The only birds around are the silent swifts. With mouths agape, their whole attention is riveted on swallowing as many as possible of the tiny insects flying around. Swifts are unable to perch on trees or hop on ground. So they rest the whole night, squatting on rocky crags or on building walls. But once they spread their wings at dawn, they fold them again only to go to sleep at dusk. Indonesians are fond of birds; they love to see and hear them. But they want them in their homes, so they set about snaring every manner of singing bird. Most Indonesian houses have several cages, holding birds. And what they do not cage, they love to eat, so forever they are out with their catapults or guns. This hunting and snaring takes an incredible toll of the bird life. The only birds to survive this gauntlet are the swifts, flying forever to hold on to dear life!



Prema Iyer

©

THE HINDU **Saturday,** *October 18, 2003*

Sense & Nonsen

Follow your nose

MADHAV **GADGIL**

A slender Loris Has a huge iris,. Looks like an owl But does not growl!



Illustration: Prema Iyer

Kadupapa or forest baby is, surely a more affectionate moniker than the Indonesian name Loris, which means a clown. Like our close kin, the chimps and gorillas, and us, slender Lorises are almost tailless.

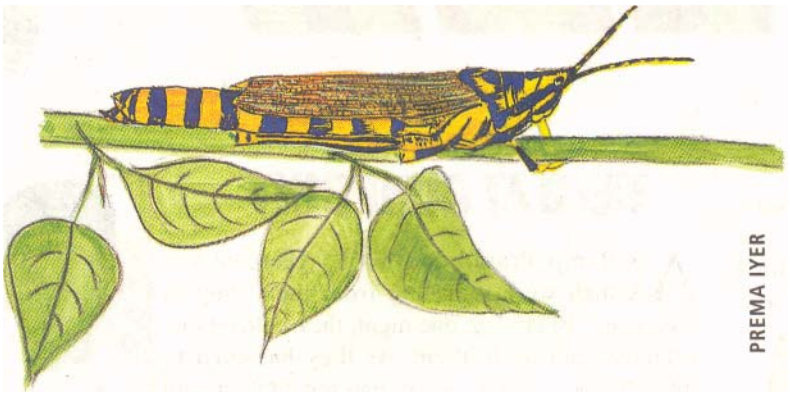
But these small, slow moving animals are only distant relatives, following a way of life quite at variance with that of monkeys, apes and men. Like most monkeys, lorises live in trees, inhabiting all types of wooded habitats from the wet forests of the Western Ghats to the dry, thorny jungles of the Peninsula. They spend the day slumbering, tucked inside a tree hole or closely pressed to the trunk, but are active through the night feeding largely on insects with occasional snacks of bird eggs and fruit. Despite their huge eyes, lorises really smell their way through life. Much of the year they live by themselves, moving around a set path amongst the branches of trees. This path they mark with their urine, smearing it on their palms. In love with its cute looks, citizens of Karnataka have designated it the State Animal. ©

For

Sense & Nonsense

For a song a Jump and dance

MADHAV GADGIL



Oh, for a song and a jump and a dance!
How pleasant to meet
Mrs. Hopper
Whose visage is colourful and gay,
It is surely quite improper
to offer her dried up hay!

Grasshoppers are among the most abundant of insects. Their hind most limbs are characteristically modified for leaping with large muscular thighs and long, slender shanks. Some of the champion jumpers can repeatedly leap one hundred times their own length without any signs of fatigue. They owe this ability to resilin, a special type of protein. Resilin has superb elastic properties, with 97 per cent efficiency in returning stored energy. This allows for an explosive release of power that catapults the insect, a task impossible for normal muscles.

Thighs of these hindmost limbs often possess special knobs or pegs that produce sound when rubbed against leathery fore wings. These sounds serve to advertise territory and attract mates. Males of the more theatrical species dance as well, some performing eighteen distinct movements. Most grasshoppers are of a sober green or brown hue but species that feed on toxic plants advertise this fact with brilliant colours. Far from being commoners then, these accomplished singers, jumpers, dancers, show-offs deserve recognition as Michael Jacksons of the insect world! ©

The Hindu, Young World, April 24. 1999

Sense & Nonsense

From an exclusive clan

On Sabarimala a sprightly Hoopoe,
Looking for an ant,
Thought she heard a sonorous chant;
Swamiye sharanam
Aye Hoopoe,
Swamiye sharanam
Aye Hoopoe!
With a joyful heart,
She chortled back,
You are blessed by
the Hoopoe
You are blessed by
the Hoopoe!



MADAME HOOPOE is a very prim and trim lady indeed. She wears a blouse of cinnamon brown, with a sari and a head scarf of bold black and white. Most of her time is spent on the ground, in meadows, gardens and open woodlands, looking for ants and other insects. Dignity demands that even as she digs for grub, she must hold her neck very erect; and since her legs are short and the beak long, she struts around with the body stiffly parallel to the ground. After all her ladyship has the distinction of belonging to a very exclusive clan; while commoners like Bulbuls and Babblers belong to families with scores of other Indian members, Hoopoe and the Crab Plover are two species with just one member each in their respective families.

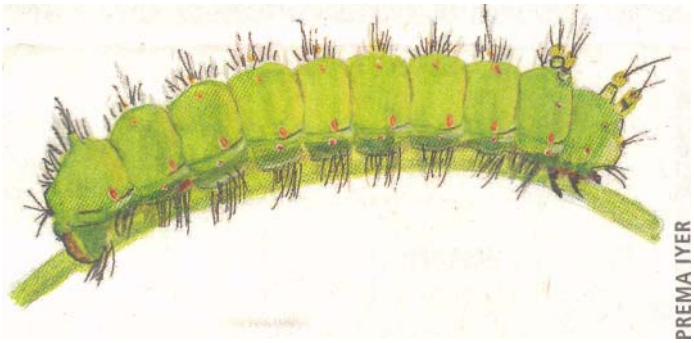
Hoopoes occur all over the country, including the Sabarimala hills covered by the largest of our sacred forests. This is a forest dedicated to Lord Ayyappa who symbolises India's rich cultural traditions of protection of nature. It is these traditions that also protect one of the most magnificent of birds on earth, the peafowl.

Illustration by Shubha Sunder

MADHAV GADGIL

Sense & Nonsens

From foes to friends



PREMA IYER

A hairy old caterpillar of Jog
Set the whole world agog By never touching a leaf And declaring its belief That it was destined to become a frog!

Many animals dramati cally appearance and way of life as they reach adulthood. The fish-like tadpole of a frog, for instance, loses its tail and on coming out of water takes to hopping around on land. But the transformation that has most captured human imagi nation is that of an ugly, hairy or warty, green or black caterpillar into a colourful butterfly or moth. This trans formation is accompanied by a radical change in the insect's equation with the plant world.

Caterpillars are enemies of plants, being little more than a pair of jaws that munch ceaselessly on plant matter and a gut enclosed in a bag of skin that digests the food so that the caterpillar may grow fatter and fatter. But having reached the limit of growth they make an about turn, for many adult moths and all butterflies are great friends of plants. In return for a sip of nectar they transfer the pollen from flower to flower, enabling plants to set seed.

Indeed, it is hard to imagine a more sensational example of what may aptly be termed a love-hate relationship. ©

THE HINDU **Saturday,** *August 10, 2002*

Glistening gardeners

MADHAV GADGIL



A mistletoe's blossom Is slender and curved, Like the beak of a Sunbird, Colourful queens of the flower world!

Birds, butterflies and the plants whose colourful flowers they pollinate have evolved hand in hand, serving each other. Some have developed particularly intimate relationships. Sunbirds, flowerpeckers and mistletoes constitute such a club of special friends. Sunbirds are among the most attractive of birds, resplendent in their iridescent hues. Mistletoes are parasitic green plants that grow on trees, with root-like organs that penetrate and draw nourishment from the tissues of their hosts. Their sugary nectar is reserved for sunbirds, whose beaks are perfectly shaped to get into the slender, tubular flowers. Lest some robbers try to force their way in, mistletoe flowers stay closed till their chosen pollinators, the sunbirds pinch them, when they explode open in a welcome. Sunbirds have tubular tongues with forked tips, superbly designed to suck the nectar with which mistletoes reward them. The sticky



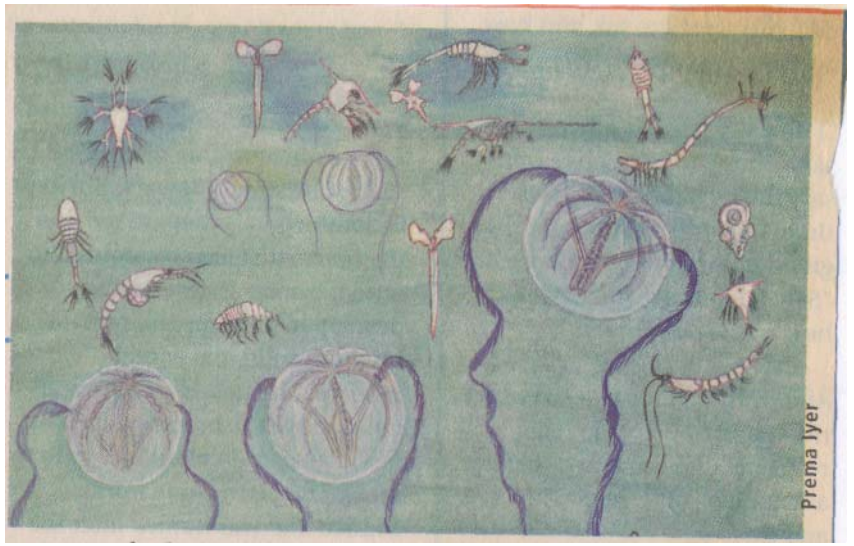
berries of mistletoes are favourite food of the flowerpeckers, who deposit the seeds most effectively on branches of host trees. In effect, sunbirds and flowerpeckers plant their own gardens of mistletoes, in man's mango orchards or teak plantations! ©

THE HINDU- **Saturday,** *October 30, 1999*



Sense & Nonsense

Glistening globes



Chasing a shrimp, the comb jelly went blimp With a big bump, On its domed hump; Sometimes transluscence, Is a big nuisance.

MADHAV GADGIL

Comb jellies are merry little globes of transparent jelly bearing two long tentacles armed with sticky cells. Propelled about by the beat of cilia fused into eight comb-like structures, they trap on to their sticky tentacles tiny free floating animals of the open waters of the sea. Marine animals living close to a solid substrate, and therefore enjoying a personal identity and a definite address, such as fishes of coral reefs, sport brilliant colours.

But members of anonymous crowds drifting about in the open watery realm lack vivid colours. They are often black on top and silvery white underneath or simply transluscent. To compensate, many of them, including comb jellies, bear little lanterns that glow with a cold silvery light. As they beat their ciliary combs, the rays of white light that comb jellies emit twist, turn and split every which way to iridisce with multi-coloured hues. As they spin around, scintillating with all the colours of the rainbow, these translucent spheres are a truly lovely sight! O

THE HINDU **Saturday,** *November 25, 2000*



Sense & Nonsense

Guardians of nature

MADHAV GADGIL

Bluebull, the merry
young antelope
fervently longed to elope.
With a lovely lady Nilgai,
who, alas, loved another
guy,
extinguishing all his
hope!



Antelopes are close relatives of cattle, goat and sheep; social beasts whose large herds roam over many parts of earth's surface. India's grasslands, scrublands and open forests once boasted enormous numbers of three antelope species; nilgai, chinkara and black buck.

Expansion of cultivation and proliferation of guns and jeeps have taken their toll and these lively animals are now largely confined to small herds in sanctuaries and national parks. Yet, here and there are wonderful examples of cultural or religious beliefs prompting people to guard our magnificent heritage of wildlife. Foremost among such guardians are Bishnois, farmers of Rajasthan and Haryana who consider antelopes their kith and kin, and protect them along with Khejadi *(Prosopis cinerarea)* trees. As a result Bishnoi villages are oases of greenery and wildlife amidst the devastated desert landscape.

Peacocks dancing around Murugan temples, monkeys roaming the villages and towns and banyan and peepal trees dotting the countryside are other instances of our rich conservation ethos. ©

Sense& Nonsense

Gutsy friends

MADHAV **GADGIL**

Termites feed on one of the most abundant and toughest of materials on the earth: cellulose. Plants employ cellulose to construct the walls that protect their cells; it also permits them to build wood. The constituents of the cellulose are so tightly bonded that few organisms possess enzymes to break them down. Termites too, lack them. That job is done by enzymes secreted by their partners, bacteria or one-celled animals, living in their guts. Termites cannot pass on these helpers to the young through the fertilised egg. Rather, the young must acquire them on their own when they hatch



rrema Iyer

out. Termites have met this challenge by becoming social animals par excellence. Indeed they are superior even to ants and honey-bees, for in termites, the males too contribute to colony labour. ©

THE HINDU, Saturday, September 18, 1999

Heralding the monsoon



Sense & Nonsen.

She spied a plaintive
chataka
pleading for the rain,
And saw one eyeing
thirstily
jewels in her chain,
To try and drink these pearls, she
said,
would be in vain!

CHATAKA or the Pied Crested Cuckoo is an immensely popular motif of Indian literature. It is a handsome black and white bird as noisy as the Koel and other members of the cuckoo clan. Perhaps cuckoos can afford to shriek a lot, for they trick birds of other species into rearing their young. They are able to do so because animals are wont to respond strongly to what biologists call "supernormal" stimuli. Herring Gulls, for instance, ignore their own eggs when offered appropriately painted wooden models, so large they cannot even climb on top of them. Cuckoo chicks similarly present exaggerated versions of the gape of the hungry chick of their foster parents, who go on feeding the parasitic chicks that may be bigger than themselves. Lipstick and mascara, ornaments and fancy clothes are, of course supernormal stimuli -familiar to us! Chatakas are rainy season visitors to much of India, so that their calls herald the onset of the monsoon in June. Poets fancy that they beg clouds for raindrops, refusing to touch any other source of water. That of course is sheer imagination!

Illustration by Prema Iyer
MADHAV GADGIL

THE HINDU **Saturday,** *September 21, 2002*

Sense & Nonsense

Heralds of spring

Text by **MADHAV GADGIL**

It's spring, come, gaze On the golden blaze Of the pudding pipe tree! Let's devour, Green mangoes sour, The koel's on a singing spree!

The rhythm of life in India revolves around the brief spell of life nourishing rains. Thus, seeds of trees must sprout with the first showers so that the seedlings will be grown enough to withstand the impending dry season. And birds must be ready to take advantage of the flush of insects at the onset of the monsoon to feed their fast growing chicks. That is why, it is at spring time, a few months ahead of the rains, that the trees bloom and birds look for mates, rendering it a time of enchantment; a time to admire flowers, to savour sour mangoes, to listen to the bird songs.



Among the loveliest sights of the spring is that of the golden blossoms of Indian Laburnum, in long, trailing, chandelier-like sprays. Its long hanging pipe shaped pods, with shiny seeds in a dark brown sweetish pulp are responsible for its other name, the Pudding Pipe Tree. It is a tree of much utility as well, its bark yielding tannin and its fruit a laxative. ©

Illustration: Prema Iyer

THE HINDU **Saturday,** *January 26, 2002*

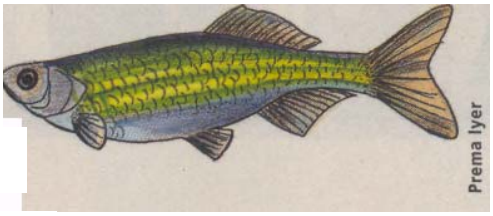


Sense *& Nonsense*

Hiding in a crowd

MADHAV GADGIL

Danio, the clannish fish loves to slither and swish; For, to get to the center, and avoid an encounter, with a snake-head is its fervent wish!



Handsome in their blue-striped, silvery coasts, Blue Danios are a common sight in Dur streams, rivers and ponds, the fresh water fish belong to three main categories: the bottom dwellers, with flattened bodies; the surface feeders, often with a flattened head; and the elegantly streamlined open water swimmers like the Blue Danios. Most of the open water fish tend to hang together, for they are safer in a crowd. With nothing else to conceal them, they try to hide behind each other, forming aggregations. In such a group, they stick to each other with the help of their eye-catching stripes, and the silvery flashes as they twist and turn. The most secure position in a bunch is in the middle, and at the slightest hint of danger, such as an approaching predatory fish like a snake-head, all the fish try to get to the centre, forcing the weak and the small to the periphery. After all, in the world of big fish eat small fish eat tiny fish, it is everyone for themselves. ©

THE HINDU **Saturday,** *July 29, 2000*

Sense & Nonsense

Hopping mad

MADHAV GADGIL



Membracids are bragging:
We are on the hop, without any stop
Up and down a tree, we are always free
To fill our bellies up, with sugar syrup.

Membracids or tree hoppers, bugs sucking plant juices are Don Quixotes of the insect world. Armed with lances, swords and shields, all growing off their breasts and backs, they come in all manners of fantastic forms.

This armoury, like Don Quixote's, seems to be to little propose. May be, it is the sheer exuberance of creatures whose belly is always full. For tree-hoppers tap into an abundant food source, the sugary sap that flows through plant vessels. All they have to do is to stick their sharp tubular mouths into these pipes and the pressure of the sap fills them up even without the bother of sucking. The only problem is the paucity of proteins in this syrup; but the bugs make up for it by harboring nitrogen fixing bacteria in their guts. So all they have to do is to dress up in showy armour. That's life-style for you.©

Sense & *Nonsense*

Hug of death

She thought she saw a peepal tree
Growing on a rocky crag,
She looked again and found it was
A fat cat in a bag:
To let this out she said, will be
An abominable drag!

MADHAV GADGIL

Peepal, and its relatives in the fig clan, represent the ultimate in the flexibility of body form, a key to the success of all the flowering plants. For, like orchids, they start life growing on other trees, or rocks, or buildings. This gives their seedlings an edge in the competition for light, but, of course, poses difficulties in terms of access to water and nutrients. So their leaves are designed to check the rate of loss of water, and their roots to seek out cracks and


Prema Iyer

crevices where soil, water and rotting organic matter accumulate. Over and above this, they have evolved abilities to use nitrogen, a key nutrient, with high levels of efficiency. These strangling figs are patient operators. Starting off high up in the canopy, their roots slowly work their way groundwards, ever more tightly 9" hugging the branches and the trunk of their host. Once the roots reach the ground they switch over to growing as normal trees, even as the host tree breathes its last in their deadly squeeze! ©

THE HINDU, Saturday, January 2, 1999

In an Octopus's garden

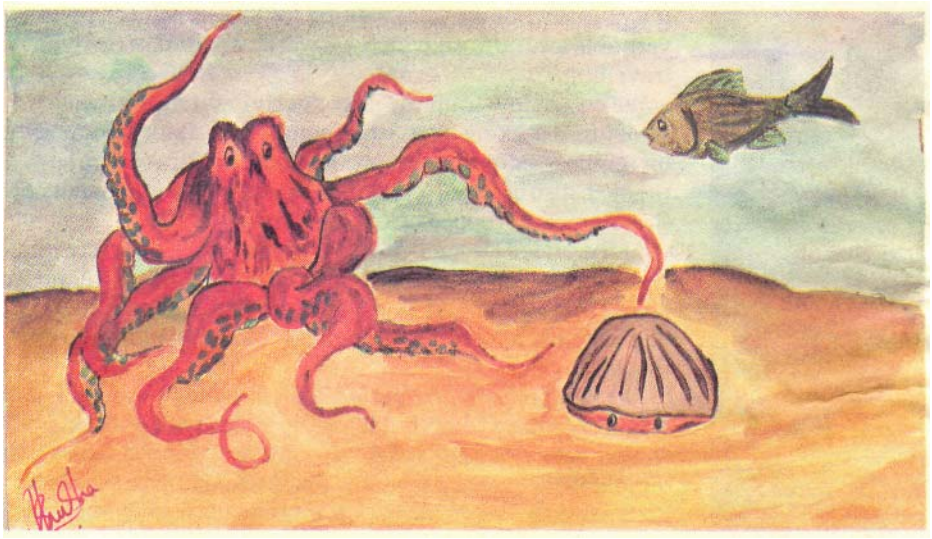
Beginning this week, noted environmentalist Madhav Gadgil writes a fortnightly column on bio-diversity.

Octopus is teaching, oyster to smile,
Without any guile Smile, I say not smirkle, So that my tentacle Can pry open a while!

Sense & Nonsense

OCTOPUSES and oysters are both molluscs, relatives of snails, mussels and squids. Worldwide, there are 66,000 species of molluscs. 5,000 of them have been recorded from India. Octopuses frequent shallow warm seas with rocky bottom where they stalk crabs, lobsters and bivalves like mussels and oysters. The eight long flexible legs of octopuses are lined with powerful suckers; they also possess strong beaks and poisonous salivary glands. Oysters are bivalved molluscs that as adults fix themselves to rocks in shallow seas. They feed on tiny floating creatures which they draw to themselves by water currents created by cilia.

Illustration: ***Shubha Sunder***



BANGALORE The Hindu, Saturday, December 27, 2003

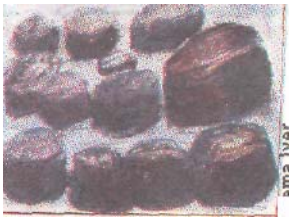
Sense & Nonsense

In slime lie our roots

MADHAV GADGIL

A stromatolite
Is a microbial mat
And great-grand-daddy
Of nut, smut and rat!

Stromatolites grow in some highly saline lagoons of South Africa and Australia. They , have been at it for the last 350 crore years, relics of the earliest known communities of living organisms that came into being shortly after the origin of life and then reigned supreme for the next 200 crore years. Stromatolites are layered microbial mats glued together by slime, solidifying as they grow and trap mineral particles. On the top lie cyanobacteria that tap the energy of light and utilise



oxygen in the fashion of modern day plants; in the under-mat live green sulphur and purple bacteria that need lower light intensities and abhor oxygen. Earth had little oxygen in its atmosphere or waters when • cyanobacteria first began to photosynthesize and release it. As the oxygen concentration £ built up, there evolved around 150 crore years ago more active animals that started grazing on these mats. This has now restricted the stromatolites to oddities in a few localities too salty fro the graziers. But stromatolites truly deserve to be revered as fore-runners to all of life on earth today. ©

Sense & Nonsense

In the queendom of ants

MADHAV GADGIL

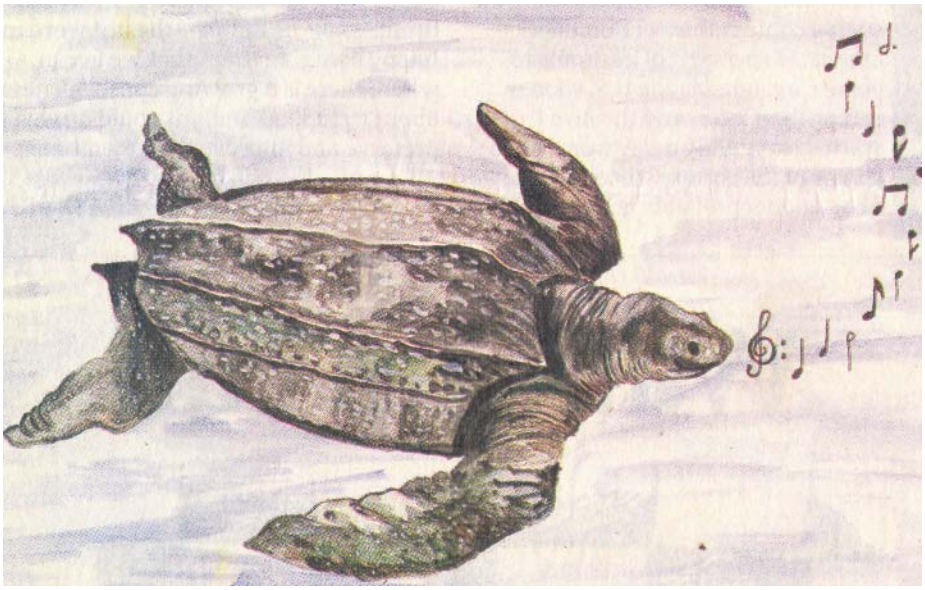


Prema Iyer

Stitching her leafy nest
She was called a horrid pest,
Weaver said, who cares?
One's brood one rears,
After all, ants know the best!

Over much of the land, the mass of ants exceeds that of all other animals put together. After all these social animals are amongst the most remarkable of creatures, having invented dairying (of insects like aphids) and cultivation (of moulds) much, much before man appeared on the scene. Ants also invented stitching, using the silk like threads that make up the cocoons of their young to fashion leafy shelters. The society of the weaver ants who live in these leafy dwellings is, like that of all other ants, a sisterhood, with an exclusively female adult work force. But in the case of weaver ants even the males make a contribution, since the sisters pick up their young brothers as they begin to secrete silk to spin their cocoons and employ the threads to weave their nests. But even this help is rendered rather reluctantly, for when quantitatively measured it turns out that the males provide significantly less silk than their sisters do!

Leatherback turtle



In Sulu Sea, a leatherback turtle: Hummed a tune so subtle That it made Mozart scuttle: Anything he ever did prattle: As simple fully of spittle!

SNAKES and lizards, turtles and crocodiles are reptiles with scales on their skins and tough shells to protect their eggs. They are well equipped to handle a life on land, but a tiny minority, about 250 out of a total of 5117 species have gone back to water. The leatherback turtle is one such; entirely at home in the sea, awkward on land to which it must return to lay its eggs on sandy beaches. The leatherback is a giant, the adults weighing as much as 600 kilos. Cold blooded animals that they are, turtles live life in slow motion, surviving for a hundred years or more. In

Sense & Nonsense

India leatherbacks come to beaches of Kerala and Andaman and Nicobar islands where their eggs are a much prized food. This egg collection now threatens the existence of many species of sea turtles. But notably enough there are reports from Tamil Nadu of some fishing communities that have the tradition of not finishing off all the eggs in a clutch, but always leaving behind one, thus ensuring long time persistence of the race.

Illustration by Shuba Sunder

MADHAV GADGIL

The Hindu February 27, 1999

Life in the slow lane



Do you know of a star that's down to earth Can you think of a fish that crawls on the rock? What chomps on mussels without any mirth? Starfish! For her prey she is quite a shock!

UNLIKE most other animals, a starfish has no front or rear end, nor right or left side; it only has an upper and a lower surface with a mouth on the bottom and an anus on the top. Around this axis its body is arranged in radial symmetry, like a lotus. Only animals which lead a life in the slow lane assume such a form; those moving at a fast clip, like us, are bilaterally symmetrical. Bilaterally symmetric animals place their eyes, ears, nose at the leading end, continually scanning for danger, looking for food. Starfishes do not need to react fast; their food is stationary, their defence lies not in running away, but in their spiny skeleton. Yet they are a highly successful group of animals with 1,200 species and abundances that can reach five individuals per square metre on bivalve beds. It appears then that a gentle tempo is well suited to life at the bottom of the sea, supplied by a slow but steady rain of food in the form of remains of plants and animals living in the water columns above.

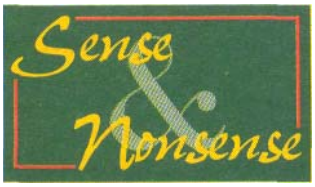


Illustration by ***Shuba Sunder***

MADHAV GADGIL

THE HINDU **Saturday,** *March 23, 2002*

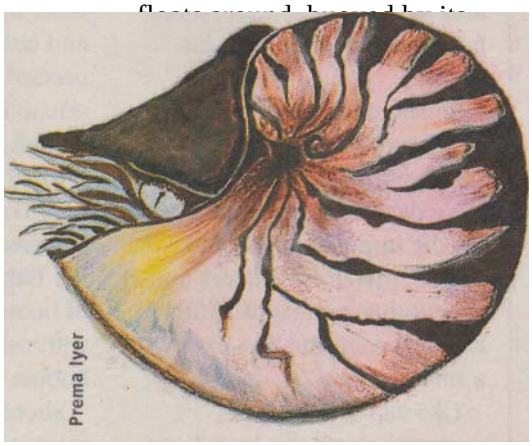


Living fossil

MADHAV GAOGIL

The shiny, pearly Nautilus
Refuses to make a fuss,
That of its great clan and done,
It now lives all alone!

Nautilus is the sole survivor of an ancient line of molluscs, a group that includes snails, mussels and octopuses. It has a handsome, glistening, coiled shell from 10 to 27 cm in size. Nautilus lives in the mid-depths of oceans, feeding on crab and carrion. From time to time, it



gas filled shell. Today there are just six, very similar species of Nautilus restricted to the Indo-Pacific. But we have fossil remains of this clan from as early as 500 million years ago. Exhibiting enormous diversity and widely distributed in the world oceans, the lineage reached its peak 400 million years ago, when one of its cousins, the Ammonites began to offer it stiff competition. The line then declined slowly, largely disappearing by 250 million years ago. Its present day representatives look just as they did when they first arose 160 million years ago, well before the origin of any of the modern group of mammals. Truly, Nautilus deserves the title of a "living fossil". ©

THE HINDU **Saturday,** *November 1, 2003*

Sense & Nonsense

Living fossils

MADHAV GADGIL



Cycas, cycas, tough survivor
Has a seed, but has no wrapper,
So she sticks it onto a shaft
And waves aloft, for she is daft!

Cycases, relatives of deodar and other pines, were the earliest of land plants to free themselves from all dependence on water, even for reproduction, more than 30 crores of years ago.

But these primitive trees have not evolved an efficient system of piping water, nor are they capable of continually thickening their trunk.

So they remain short and stocky, with an unbranched trunk that terminates in an umbrella-like rosette of large leaves. The male and female trees are distinct, the former bearing large cones from which masses of pollen are cast to the wind.

The female trees bear a number of short modified leaves on which are borne naked ovules, not boxed in by a covering as in the case of the more highly evolved flowering plants. The seeds that develop on fertilization are fleshy and dispersed by animals.

Cycases are prized as ornamental plants with their leaves serving as sheaths for bouquets of flowers. So at our hands they come to enjoy the company of full blown flowers of their more colourful descendants. ©

THE HINDU **Saturday,** *July 1, 2000*

Sense & Nonsense

Lords of *water*

MADHAV GADGIL



Little Grebes are urging Shovellers to swim And dive with a whim, Make a splash, not waddle, Land's a fiddle-daddle, In water you stay trim!

Water-lilies and waterfowl, *padma* and *hamsa* have fascinated Indians for centuries. They are among the most favoured of motifs in Indian poetry and art. We have a rich variety of such waterfowl: ducks, geese and swans, egrets, herons and storks, ibises, cranes and pelicans, cormorants, darters and grebes -over 213 species in all. This variety exemplifies the many different ways in which birds have learnt to make a living out of the watery habitat.

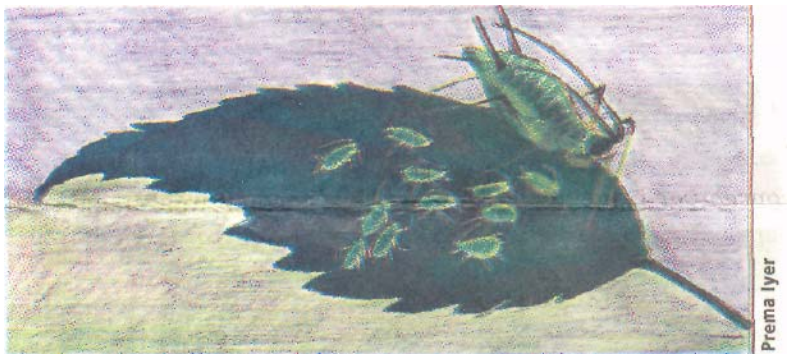
Among the tiniest of swimmers is the Little Grebe, fond of clean open waters, ever willing to dive down to chase little fish and shrimp, often surfacing a goodish distance away. The Shoveller is quite a contrast, fond of shallow waters full of weeds and algae, where it spends most of its time sieving mud and muddy water for tiny animals through its flat-edged shovel-like beak, almost never diving entirely below the water. It may even step on land to waddle along, something the Grebe will never dream of doing. Marvellous are the diversity of roles that the evolutionary drama has unfolded for its many actors on the ecological stage.©

THE HINDU **Saturday,** *September 25, 2004*

Sense & Nonsense

Lottery of life

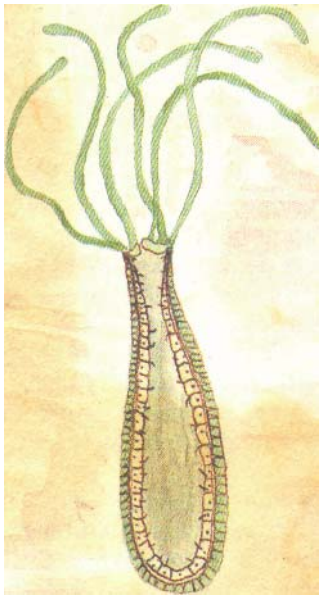
MADHAV GADGIL



There is no mom For an aphid groom While babies boom! But when things get rough And kids must be tough Sons appear right enough! Aphids are tiny bugs that make a living by sucking plant juices. Such food is plentiful, once a succulent host is located. It is clearly a good strategy to breed rapidly when the going is good. So while food is abundant, aphids dispense altogether with males, thereby doubling their reproductive rate. They also dispense with wings, producing young that stay close to parents. As food becomes scarce though, they change tack and produce winged young that take off in search of greener pastures. Moreover they produce both sons and daughters, so that sexually produced offspring would not all be alike, and at least some of them would do well in the new habitats. Asexually producing a hundred daughters, all like the mother is like holding hundred lottery tickets, all with the same number. Producing 50 daughters and 50 sons to reproduce sexually means holding 50 lottery tickets. But all with different numbers. Indeed, sex seems to have evolved as insurance in the lottery of life! ©

Many-celled hydra





Others may shit,
But Hydras only spit,
Through the mouth,
It may seem uncouth,
But for such simple creatures,
It is a hit.

HYDRAS, tiny creatures crawling on freshwater plants, are amongst the most primitive of many-celled animals. Their bodies are simple sacs with two layers of cells, one facing the outer world, the other the inner cavity. The food, which can include much more complex animals such as tiny shrimp-like creatures, is taken in through the only opening to the inner cavity, the mouth, which also spits out the indigestible remains. Thus, despite the very simple organisation Hydras function just fine. And the simple organisation has its advantages. Since no part of the body of the animal is specialised even tiny bits can regenerate the full animal. So a Hydra may be cut up into as many as 200 pieces, and each piece can regenerate into a full Hydra. Pretty convenient when a predator has bitten off a chunk!

Illustration by Shuba Sunder

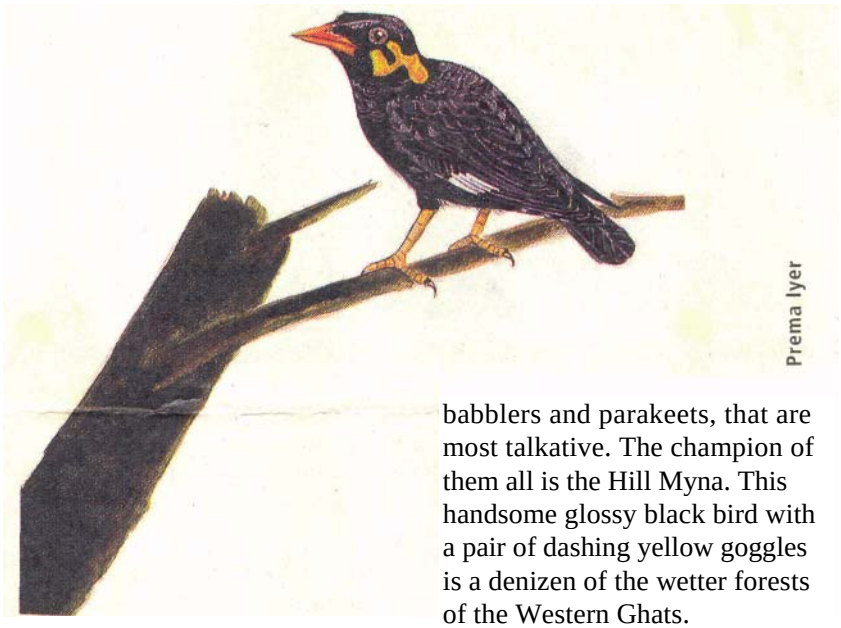
MADHAV GADGIL

THE HINDU **Saturday,** *March 11, 2000*

Sense & Nonsense

Master mimics

MADHAV GADGIL



Glossy black Hill Mynajee,
Chirpy as a bird can be, Every couple has ditty their own So as mimics they win renown!

Like monkeys and men, birds live in a world of sights and sounds. Birds use their hearing to detect prey and predators, but above all they call to others of their own species. Naturally it is the more sociable birds; mynas and crows, babblers and parakeets, that are most talkative. The champion of them all is the Hill Myna. This handsome glossy black bird with a pair of dashing yellow goggles is a denizen of the wetter forests of the Western Ghats.

As in many other myna species the Hill Mynas are paired for life and the couple keeps up a constant chatter among themselves. The Hill Mynas are special in that the husband and wife develop a dialogue all their own, distinctive for each couple. An ability to learn and mimic new sounds is essential to do this, and Hill Mynas possess superlative skills of imitating new sounds. As a result they are among the most prized of bird pets.©

THE HINDU- **Saturday,** *February 26 , 2000*


Prema Iyer

Mobsters *supreme*

MADHAV GADGIL

The smile of a crow is quizzical and wry,
Whose meaning is abundantly clear;
It says I will bully you, however you try,
To escape me, you can't, my dear!

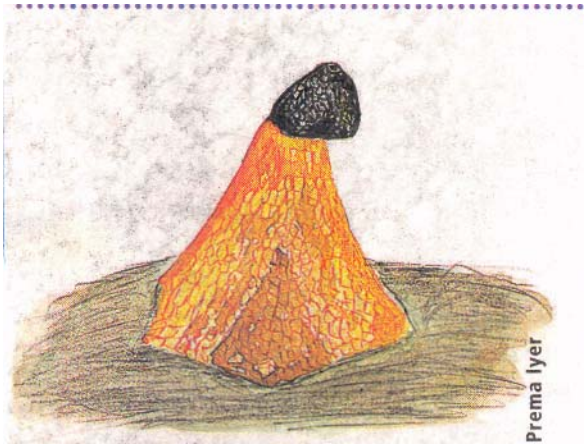
That grey-headed scoundrel, the house crow, and the big black bounder, its jungle relative are impudent neighbours of man all over India. They are the most versatile of birds, with powerful beaks that can handle anything man eats, and many things man won't. They roam about in loose parties and can rustle up a gang with their loud cawing whenever the occasion demands. Often the occasion is to bully others, small birds to prey on their eggs and chicks, or bigger birds, even dogs, monkeys or men to rob them of food, or just to harass them for its sheer pleasure. *Pariah* kites are favourite victims of such sport. But perhaps this is not just for amusement for other much milder creatures also mob predators. Magpie robins, wren warblers and palm squirrels will mob and screech around owls, and in a forest chattering of monkeys and numerous birds will mark the passage of a pan ther. Such mobbing must serve to warn potential victims that a predator is on prowl and reduce the risk of their falling prey. ©

THE HINDU **Saturday,** *March 3, 2001*

Sense & Nonsense

More animals than plants

MADHAV GADGIL



Time has come, the mushroom said
To quit this green hued clan;
Glycogened we, not starchy staid,
No paper coats, but chitined with elan!

The fungi; mushroom and moulds, mildews and yeasts, were once consid ered plants. But no longer. Their chemistry proclaims them that to be closer to animals. Starch is the preferred form of energy storage in plants, glycogen in animals. Fungi employ glyco gen. Walls of plant cells are made of cellulose, from which we manufacture paper. Animals use structural molecules like chitin which constitutes the external skeleton of insects and crabs. Fungal cell walls are made up of chitin. Even the nucleic acids making up the hereditary material of fungi are closer in composition to animal nucleic acids.

Fungi use ready made food in the animal fashion unlike green plants who manufacture their own. Like animals fungi too digest their food with the help of enzymes. But there is a striking difference. Fungal enzymes are externally secreted. While animals first ingest their food and then digest it internally fungi first digest it and then ingest the simpler molecules. For all these reasons fungi are now removed from the plant kingdom and placed in a separate kingdom, all their own.

THE HINDU Saturday, May 1O, 2003

Sense & Nonsense

Mountain connection

MADHAV GADGIL



Laughing Thrush scampers under a tree

Merry, merry king of the woods is he;

Laugh! For your babble is full of glee

Laughing Thrush gay you life must be!

Laughing Thrushes, and their close relatives, the babblers are the most parochial of birds. They do fly, of course, but prefer to spend their lives scurrying in the under-scrub, rummaging for grubs in the leaf litter on the forest floor. They live in small, tightly knit flocks that are fiercely loyal to their own little patches of wooded country, moving no more than a few kilometres over their whole life-spans. As a result, most species have pretty narrow geographical ranges.

There are as many as 26 species of Laughing Thrushes in the Himalayas, most of them in the north-eastern hill states, contiguous with their major theatre of evolution in South-East Asia. Only three species have made it to the humid forests of the southern Western Ghats, leaving a huge gap in between. Amongst them, the Nilgiri Laughing Thrush has the most restricted distribution, being confined to the higher elevations on either side of the Palghat gap. It may be one of the latest arrivals on the evolutionary stage, not having had enough time to spread out. ©

THE HINDU **Saturday,** *March 29, 2003*

Sense & *Nonsense*

Mutual aid

MADHAV GADGIL

Fluttering at night you - naughty fat bat, How I wonder what you are at! Feasting on mango, jack and fig, There's no doubt you have made it big!



Flavours of figs, fragrances of jasmines, colours of coral tree blooms, have all evolved to facilitate the transfer of pollen and the transport of seeds. Amongst the most striking of animals specialised to perform these tasks are fruit bats, whose nightly visits to sip the nectar and devour pulpy fruits help myriads of trees multiply themselves. Figs of a great variety, among them banyan and peepal, are a particularly important food source for the bats, for in contrast to most other species, those of the genus *Ficus* tend to fruit, of and on, all round the year. Indeed, it is believed that a whole assortment of insects, bats, monkeys and squirrels sustain themselves on figs when no other fruit is available. As a result, *Ficus* trees are termed a keystone resource, supporting a diversity of other life forms. It is perhaps in recognition of this role that most trees of this genus are considered sacred, in India in many other countries of Asia and Africa, and on islands in the Pacific ocean as well.

Illustration by Prema Iyer©

THE HINDU **Saturday,** ***July*** *5, 2003*

Sense & Nonsense

Never say die

MADHAV GADGIL

How happily doth the wallaby chomp on its spiny food Full of wonder sheep and men have done it a world of good!



Wallabies, or Junior Kangaroos, are amongst the most abundant of marsupial mammals. Ecologically, they play the same role as our sheep and cattle; and, like them, are able to digest cellulose from the toughest of grasses with the help of a special bacterial flora in their stomachs and small intestines. Wallabies thrived side by side with man for upwards of 45,000 years till the modern man with gun and greed reached Australia a few centuries ago. For these settlers, wallabies meant meat for their dogs and cats, and the competitors for the sheep, valued as providers of meat and wool for themselves. So they shot and continue to shoot wallabies in millions. Yet wallabies have held their own, for they are far better than sheep at withstanding heat and drought. Moreover, wallabies relish Spinifex, a tough spiny grass that sheep detest. As sheep graze, and eliminate more palatable species, Spinifex multiplies to the great delight of wallabies. So the harder the ranchers try to raise sheep, the more wallabies do they reap!

In the article "NRI bucks" published in the *YW* dated June 21 the illustration was by Sanjeeva Nayaka and not as mentioned.

THE HINDU **Saturday,** *April 27, 2002*

Sense *& Nonsense*

Night melodies

MADHAV GADGIL

Up, Up and listen to the crickets call, He is no mean preacher, Tune in to the trills that enthral, Let nature be your teacher.*


Prema Iyer

Crickets and frogs, birds and humans are among the most gifted of vocalists on earth. Crickets and frogs are creatures of the night; birds, largely of the day. People, of course, love singing through the day and night. Much of this singing is in service of love; enticing mates to get together. Employing sound for this purpose makes eminent sense for small creatures like crickets, who live widely scattered, and who must communicate in the dark. Crickets, kin of grasshoppers and locusts, produce their chirps by rubbing the file-like hind edge of the left fore-wing against a scraper on the right fore-wing. The calls are of two types, the long distance call song, and the more intimate courtship song. To hear each other, crickets are equipped with eardrums on their forelegs. Some cricket species that love warm rotting vegetation readily switch to living within human dwellings. Their incessant trills at night are enchanting music to some people; other find them nerve-racking. All said and done, beauty resides in the listener's ears. ©

THE **HINDU** **Saturday,** *June 21, 2003*

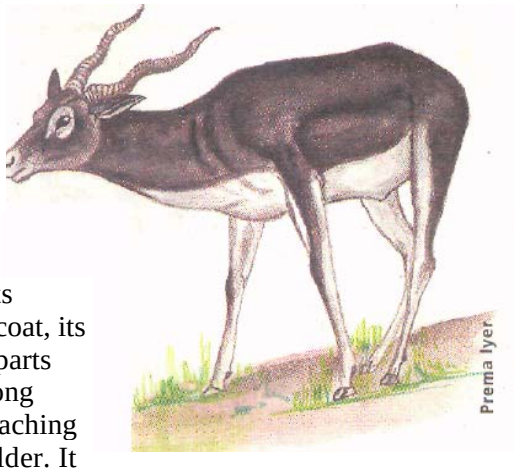
Sense & Nonsense

NRI bucks

MADHAV GADGIL

Where herds and herds of blackbuck stand
And fires burn, that's my land!

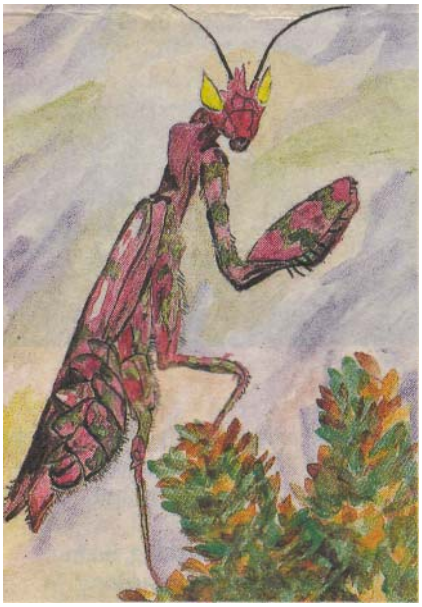
Blackbuck is quintessentially an Indian animal. So much so that the ancient law-giver Manu declared that boundaries of his land of fire sacrifices coincided with the natural distribution of this attractive antelope. Blackbuck is indeed a handsome beast with its glistening tan or black coat, its sparkling white under-parts and stockings and its long screw-shaped horns, reaching all the way to the shoulder. It is a lover of dry, open plains, dotted by shrubs and trees, scarce bothered by shortages of water. A vast majority of its antelope relatives inhabit just such savannahs that abound on the continent of Africa, that was also where our own species evolved, and perhaps Manu's choice of blackbuck to characterise our country owes itself to this ancient kinship.



Once millions of blackbuck roamed India. Today their numbers are countable in a few thousands. But they have been introduced to the plains of Texas, which now holds a population of blackbuck larger than that in its native India. Perhaps these NRI bucks too should be granted dual citizenship!

Illustration : Sanjeeva Nayaka©

On her knees



Come into my prayer hall, Said the Mantis to the Fly, I shall have a feast, While to heaven you apply!

MANTIDS are the most patient of animals, sitting still, occasionally rocking gently back and forth for hours, even days on end. They are masters of camouflage, mimicking dry twigs or green blades of grass, mottled lichens or colourful flowers. The forelegs are held up folded, as if in deep reverence to some god of the insect world. But these prayerful arms are deadly weapons, equipped with a pair of double saws and a vicious bill-hook.

Mantids have long necks and barrel-shaped heads covered by two enormous compound eyes that enable them to look to the front, to the sides and alone amongst insects even back over their shoulders. The moment a quarry - a cricket, a fly, even another mantid- drifts within striking distance the forelegs shoot out like lightning, unerringly capturing the victim. Mantids love the warmth of the tropics, so that India with just over two per cent of the land area of the world, has 162 of the 2210 species recorded so far.

MADHAV GADGIL

Illustration by Shubha Sunder

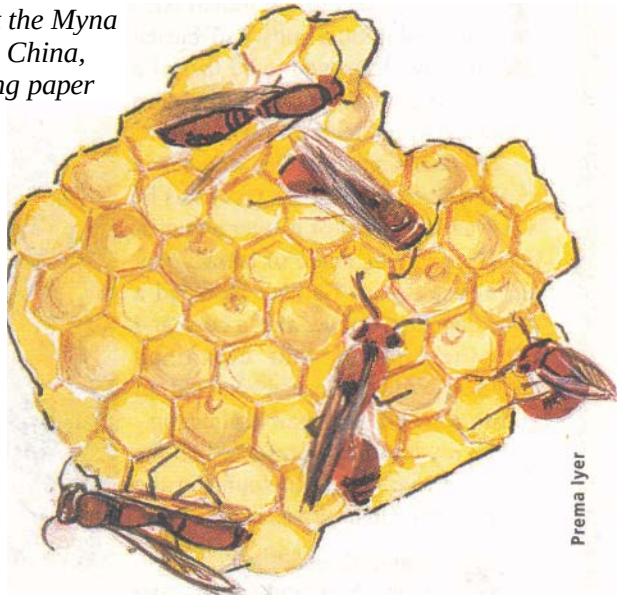
[THE HINDU **Saturday,** *November 16, 2002*

Sense & *Nonsense*

Paper that's forever

MADHAV GADGIL

The paper wasp, and not the Myna
Nor even the men from China,
Led the world in making paper
To lodge, not write, on a quilt of fibre!



Long before humans stepped on earth, our social forebearers, wasps and ants, bees and termites came up with many innovations that we are so proud of today. For millions of years, they have been constructing elaborate shelters, husbanding plants and animals and using intricate signals to guide their companions to food sources. One of the wasp clans has even been manufacturing paper, not to write on, of course, but as a structural material for their lodgings. This they accomplish by chewing up plant material to tease out the fibres and then gluing these into sheets with their sticky saliva. This is essentially the same process that the Chinese discovered 2000 years ago, and that we use to this day.

But paper wasps treat their building material with some special chemicals. I have one such gigantic paper wasp nest hanging in my office for the last 15 years, and it looks as good as new, even as I daily struggle to keep silverfish and mould at bay from books and herbarium specimens! ©

THE HINDU, Saturday, January 30,1999

Pecking at wood



How much wood would a woodpecker checker
If a woodpecker could chisel wood?
As much wood, as a woodpecker would
Checker if a woodpecker could chisel wood!

Sense & Nonsense

WOODPECKERS are wonderfully adapted to their diet of insects and their larvae which hide in the crevices of tree trunks. With sharp claws serving as climbing irons, and a stiff supporting tail, they clamber up and down tree trunks with great ease. Their strong beaks permit them to chisel through wood, and their long horny snake-like tongues armed with hooks effectively gather up the prey. Their skulls and beak muscles are specially designed to absorb the shocks of hammering on wood, leaving their brains unharmed.

Worldwide there are 209 species of woodpeckers present in all continents excepting Australia. India has 30 species; this picture shows three of them; the rufous, the goldenbacked and the yellow fronted pied woodpecker.

Illustration: ***Shubha Sunder***

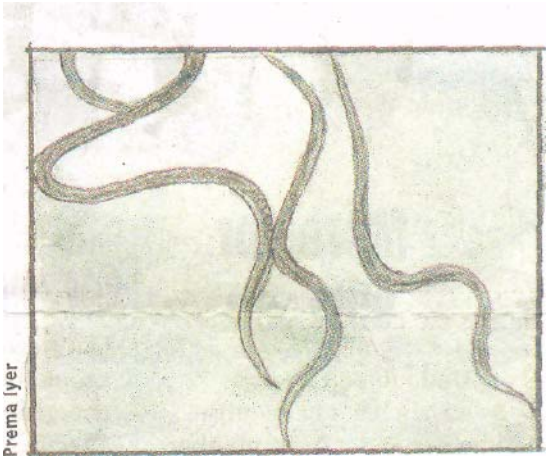
MADHAV GADGIL

Hindu Young World, Saturday, March 13, 2004

Plentiful, yet little known

MADHAV GADGIL

Out of sight and out of mind To threadworms we all are blind, But try to count and you will find Vastly more than any other kind!



If, by some magic, all matter from earth's surface were to be wiped out, leaving just threadworms behind, a giant sphere would still envelope the globe! For threadworms are by far the most plentiful group of many-celled animals, greatly exceeding even insects in their numbers and the range of habitats occupied, But we hardly know these simple animals built out of a fixed, limited number of cells. Moreover, the fates of the cells are sealed from a very early stage. Yet, despite this apparent limitation, threadworms are amazingly successful. They abound in mud at the bottom of water, salt or fresh, and in the upper layers of soil everywhere. Many feed on dead matter, a few hunt smaller creatures, and others parasitise just about every species of plant and animal. They have had a dramatic impact on human affairs as well. It is believed that the great Mayan civilisation collapsed because threadworms built up to stupendous levels in their fields. It is worth remembering that it was these farmlands that gave the world maize, tomato and chillies! ©

THE HINDU Saturday, June *7, 2003*

Sense & Nonsense

Poison on the plate

MADHAV GADGIL

The chirpy house sparrow
Is chockfull of sorrow
That in trendy Bangalore
No more are sparrows galore!



The house sparrow is one of the creatures to have benefited most from man's ascendance. For, like us, it subsists largely on grass seeds. Unlike us, though, it does not need to grind and bake them, for nature has outfitted it with a conical beak that can bite through the toughest of seeds and a digestive system that can extract the nutrients. Our ancestors had to tame fire three lakh years ago, before we couldn't tap into this bonanza. Initially fire would have encouraged growth of wild grass, before we took to cultivation of cereals ten thousand years ago. This explosion of their food must have attracted sparrows and other finches to human habitations. Why, alone amongst them, it was the house sparrow that moved in with us, is anybody's guess. But it did so to its great advantage, till a few years ago. However, times are changing, and we lace their food with liberal doses of pesticides the .sparrows are on the decline, nearly gone from many other parts of India.

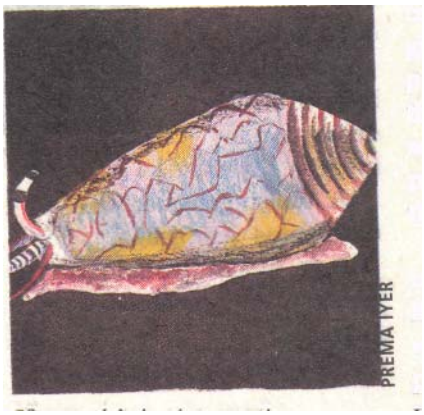
Illustration by Prema Iyer©

THE HINDU **Saturday,** *April 13, 2002*

Sense & *Nonsense*

Poison tongue

MADHAV GADGIL



If you think of a snail As slow and mild; Meet Ms Cone: Who's venomous and wild!

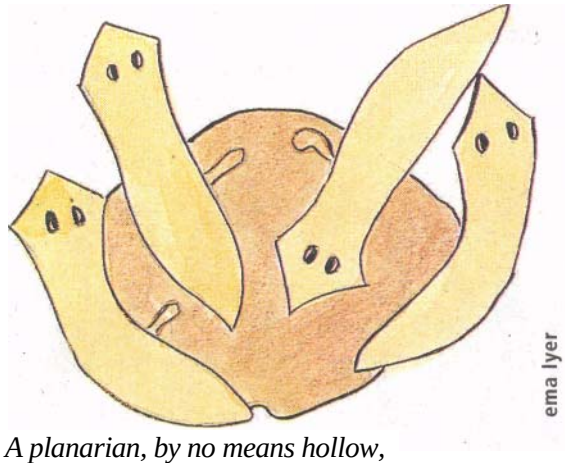
Cones are among the prettiest of snails with elegantly shaped, vividly coloured shells. But they are a far cry from the popular image of snails as gentle creatures. For Cones are the cobras of the sea, equipped with a series of hollow harpoon-shaped teeth connected to a tubular poison gland ending in a muscular pumping organ. Not only can they shoot these venom darts, some even fire a fine jet of poison like a spitting cobra at their worm, snail or fish prey. Most species of Cones dwell in crevices on coral reefs, or lie buried in the sands of the warm Indo-Pacific seas. Their poisons inhibit the flow of nerve impulses to the muscles, and are today being vigorously investigated by the pharmaceutical industry. Indeed, looking for economic products from sea animals is very much in fashion now. This is of great relevance to India, for while South America surpasses South Asia in the diversity of life on land, Indo-Pacific seas are the world's greatest treasure trove of the diversity of marine life. ®

THE HINDU **Saturday,** *January 20, 2001*

Sense & Nonsense

Primordial lovers

MADHAV ADGIL



A planarian, by no means hollow,
Finds joy in haunting waters shallow;
This brainy lover is very fond
Of a romantic lily pond!

Planarians are the simplest of the brainy animals.

Before they stepped on the evolutionary stage all animals were either sedentary and asymmetrical or if they moved they were radially symmetrical like the flower of a lotus. Planarians were amongst the earliest creatures with a definite head end. So they concentrated their sensory and nerve cells near the front forming a pair of primitive brains. Their bodies elongated developing a bilateral symmetry with a right and a left edge.

But these flat worms simply have several layers of cells with no internal cavity, so that their organ systems are still rudimentary. But, having decided that simply releasing eggs and sperms in water as their ancestors did, was wasteful, these brainy beasts invented mating. It is no wonder then that a romantic lotus pond is a favourite haunt of these primordial lovers. Here you are bound to encounter them crawling on the underside of lily pods, or swimming at the very surface of the water.

Illustration by Prema Iyer ©

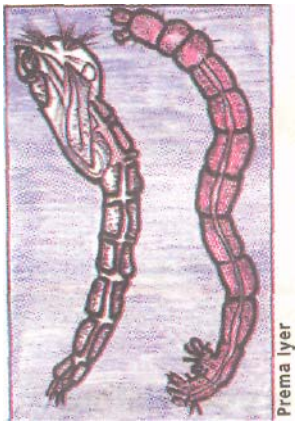
THE HINDU Saturday, *October 16, 2004*

BANGALORE

Sense & Nonsense

Red and brave

MADHAV GADGIL



The plucky little bloodworm, Will never squirm, For acid most vile Just makes it smile!

Chironomids are cousins of mosquitoes; some of them are chockfull of haemoglobin, the red pigment of blood, otherwise found only in higher animals. Not that they drink blood; they only sip nectar from flowers. Moreover, this haemoglobin, present in their worm-like aquatic larvae, always remains saturated with oxygen, and, therefore, does not serve to transport that gas. Instead, oxygen diffuses in through their thin body covering. So, what good does it do to these bloodworms to manufacture this exotic molecule? It turns out that it confers on some species an ability to survive for long periods in waters absolutely devoid of oxygen. Yet others seem to be able to tolerate exceedingly acidic conditions. As a result, chironomids are masters of some of the most polluted waters on earth, a commodity that is regrettably growing day by day. Several chironomid species, therefore, serve as reliable indicators of pollution; indicators that are very easy, even for school students, to assess. Chironomids thus have the promise to become an effective tool iri the citizen's armory to fight polluters. ©

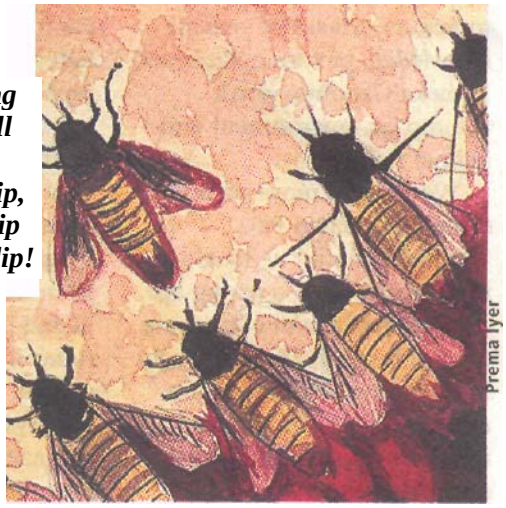
THE HINDU **Saturday,** *May 22, 2004*

Sense & Nonsense

Save these monuments

MADHAV GADGIL

Rock bees are hoping
That sloth bears will slip
And fall at a fast clip,
Cheated of even a sip
Of the tasty honey dip!



Rock bees, biggest of our honeybees, are tireless workers, collecting pollen and nectar not only during -the day, but through moonlit nights as well. They are to be found everywhere, in the densest forests and in the midst of cities, their large hives festooning huge trees and tall buildings with the same gusto. All they look for in anchoring the hives is a place well off the ground. For they know that their honey and young are a delicacy for sloth bears and men. Both bears and men are excellent climbers and bees are safe only on distant branches of tallest of trees or on the most inaccessible of rocky crags or overhangs of buildings. Alas, most of our colossal trees have disappeared, converted into plywood sheets, exposing these magnificent social insects to a serious shortage of nesting sites. Such massive forest trees are a refuge for a variety of other creatures as well, be they lowly mosses, lovely orchids or hole-nesting hornbills. It is time that we strictly halted felling of any more of these giants! ©

THE HINDU **Saturday,** *December 15, 2001*

Sense & Nonsense

Scratch to score

MADHAV GADGIL

A jolly young macaque called
Red-face, Groomed his
friends with such grace;
That— though his foes fought tooth and nail
It was to no avail,
Redface's clique they couldn't displace!

Equally at home in forests and orchards, on farms and in villages, in towns and cities, the red-faced Bonnet Macaques are amongst the most successful of our mammals. In very many ways, they are unique. In most other monkey species, males necessarily leave the troupe of their birth on reaching adulthood. In Bonnets some males do, but others stay put. So, many adult males in a Bonnet troupe would have known each other right from their birth. They form cliques to help each other rise in social hierarchy. These cliques are

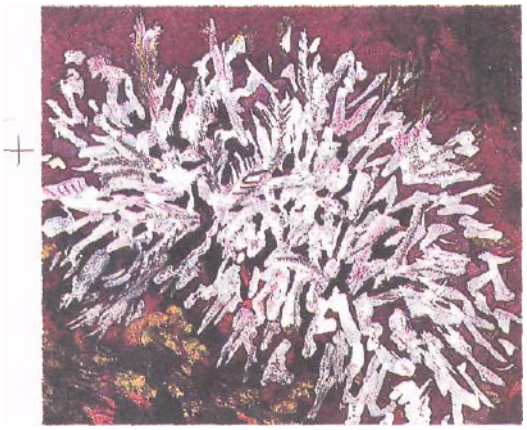


notable for the high rates of grooming amongst the members. The females groom even more intensively; both sexes surpassing levels known from other species. Finally, Bonnets are unique in that occasionally a monkey higher in the social hierarchy will actually condescend to groom a lower status individual. It is quite possible that the success of this cheeky little monkey is largely due to the solidarity within the troupes that all this "You scratch my back and I will scratch yours" generates. ©

Sense & Nonsense

Sea mats

MADHAV GADGIL



A crusty old ectoproct Has very little tact, To bite and smother all comers Is it only act!

Ectoprocts are tiny colonial animals that carpet the sea floor, growing on mud and rocks, seaweeds and shells. Waving their tentacles about, they create water currents that bring their food to them. These waters are a broth of tiny creatures and detritus, permitting a variety of marine animals, sponges and corals, worms and barnacles, to feed on them while remaining glued to one spot. To prevail in the ensuing struggle for survival, these animals follow many tactics; settling on top of each other, or growing over and smothering a rival. Naturally, there is a premium on a fast growth rate, and ectoprocts have adopted one of the fastest modes of reproduction, namely, budding off new individuals. The different members of the colony thus formed sharpen their competitive edge by practising division of labour. Some create water currents, others form lids, yet others, looking uncanny like beaks of birds, bite off any rivals trying to settle on top of their colony. This serves them well, and though rather inconspicuous, ectoprocts are amongst the commonest of marine animals.

Illustration by Prema Iyer ©

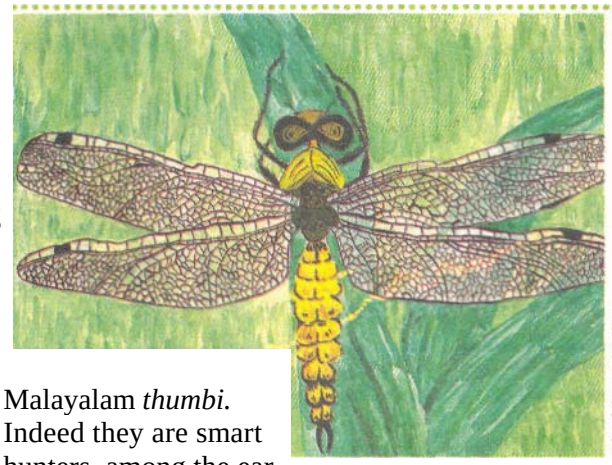
THE HINDU **Saturday,** *January 29, 2000*

Sense & Nonsense
Short-lived *wings*

MADHAV GADGIL

* iuh ••*•»%**•«•* ii' lu u vt m w •» * » ff » « a' Hi m

Chatur means clever, also a dragonfly! Strong of wing, and goddamn sly, Born of water, it takes to sky, Foremost of animals that learnt to fly.



Shubha Sunder.

Dragonflies are among the most eye-catching of insects, flying powerfully in mass formations near water bodies. Over much of India they are popularly known as "helicopters." Their Marathi name is *chatur*, or clever; the Tamil and Malayalam *thumbi*. Indeed they are smart hunters, among the earliest animals to take to wing, preying on creatures in the swamp forests that gave rise to the great coal beds of today. The ancestors of the first land animals and plants lived in fresh waters. The young of dragonflies still live in streams, where they too are ferocious hunters. The crab-like forefathers of insects had two parts to their limbs, a walking leg below and a breathing gill on top. Insects converted the gill into a wing, unlike birds and bats which sacrificed their front legs. The insect wing is extremely light, for it is eliminated of all living tissues. As a result, damages cannot be repaired. So winged dragonflies and other insects must settle for a much shorter life than their wingless young. In contrast, the birds and bats have long adult lives following much shorter immature phases.®

THE HINDU **Saturday,** *February 23, 2002*

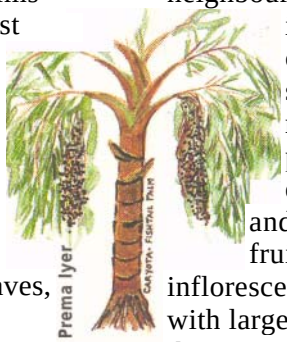
Sense *& Nonsense*

Sip and be glad!

MADHAV GADGIL

How gaily doth the Fish-tail Palm
Wave its giant frond;
Inviting flies and bees to sip
And cement their bond!

With their tall, slender trunks topped by a crown of gigantic leaves, palms are among the most graceful of trees. Of them, the Fish-tail Palm, a native of south and south-east Asia, is perhaps the most elegant. Palms not only have huge leaves, they also produce enormous inflorescences, bunching together thousands of flowers. The inflorescences of the Fish-tail Palm are particularly big, for this species starts flowering only on completing its vegetative growth, reaching heights of up to 20 metres. These concentrated sources of nectar help the palms attract bees and other pollinating insects away from neighbouring plants, for there is always a keen competition for the services of the match-makers. To produce this large quantity of nectar, and later to nurture the fruit, the stalks of the inflorescences are equipped with large vessels to bring in the required nourishment. As a result, staggering quantities of sugary syrup flow daily to each inflorescence. Our Fish-tail Palm holds the world record, yielding, when tapped, as much as 20 litres a day. ©



THE HINDU **Saturday,** *January 31, 2004*

BANGALORE

Sense & Nonsense

Six-legged Rhino

MADHAV GADGIL

Meet Mr. Rhino Beetle With a lovely horn on his nose,
In a shiny coat of armor He strikes a charming pose!

S tout and heavy, rhinoceros beetles are prominent members of the most prolific of insect tribes, that of beetles. They not only possess shining hard wings, but sport a horn up front and stylish bumps on the back. Like their mammalian namesakes, Rhinoceros beetles love to eat leafy matter. The best known of Indian species specialises in consuming tender leaves of the coconut palm, so that when they unfurl the mature leaves exhibit a variety of geometric cuts. Beetles are remarkable for using a wide variety of resources. They chew up leaves, burrow inside wood, munch on seeds, chomp on fungi, lap up dung, and hunt other animals. They burrow underground, crawl on forest floor, swim in water. This has rendered them so successful that one out of every five species of living creatures is a beetle. This ubiquity prompted J.B.S. Haldane, the famous evolutionary biologist who embraced Indian citizenship to protest against the British invasion of Suez, to declare that all he could surmise of God was that He must be inordinately fond of Beetles!



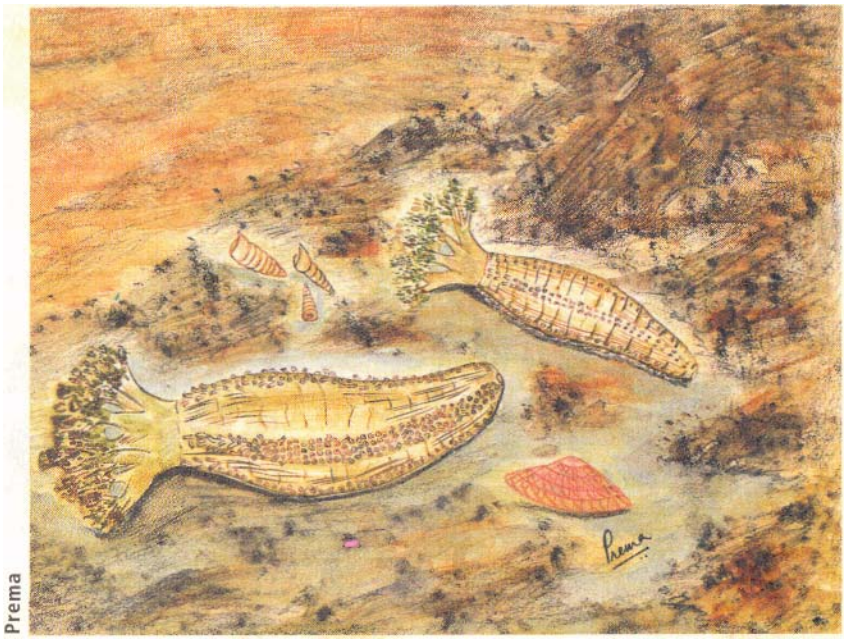
Illustration by Prema Iyer©

THE HINDU Saturday, December 18, 1999

Slimy *warriors*

MADHAV GADGIL

Sense & Nonsense



She *thought she saw a cucumber*
covered with sand and mud,
She picked it up and found it spewed
sticky bits and crud,
This has the making of, she said,
the gooiest of salad!

Sea cucumbers are sausage shaped relatives of starfish with leathery, muscular skins. While starfish are active hunters, preying on mussels and snails, sea cucumbers lie lazily on sea bottom, devouring sand much as earthworms eat mud. There nourishment comes from the tiny film made up of micro scopic algae and animals that cover each sand grain. So they must eat prodigious quantities of sand, and it is estimated that, in warm seas, this amounts to one to two tonnes per hectare every year. These sluggish creatures have their own weapons to fight enemies, and these are tough, sticky threads that can stretch to thirty times their original length entangling the predator. Some even spew out their slimy visceras through tears at the rear end. So picking up a sea cucumber can be quite a sticky proposition. That, of course, has not prevented people from becoming their foremost enemies, for "trepang", a soup of sea cucumbers is a popular delicacy in southeast and east Asia. ©

Saturday, *February 28, 2004*

Sense & Nons

Smooth as silk

MADHAV GADGIL

A giant wood spider Needs no cider, To wash down her bait, For she drinks it straight!

The web of a Giant Wood Spider is a grand affair, often stretching four metres or more across a forest path. The silk that goes into its fabrication is by far the toughest of natural fibres. It comes in many forms. The strongest is the stiff silk for structural fibres of the web that can withstand the struggles of even small birds. Another form cements these sturdy threads to each other and to branches to trees from which the web is suspended. The quarry is trapped with the aid of a special sticky silk, while a rubbery silk serves to carry the sticky silk onto the web. Finally a thin weak silk, spun as multiple fibres, serves to wrap the prey. Thus secured the prey can be drunk at leisure. For spiders prefer to digest their food externally with their strong pumping stomachs rhythmically vomiting and sucking the resulting juices. Relaxing in the cool shade of the woods, ensconced in a silken tent, sipping on the juices of a colourful butterfly; that is some life!

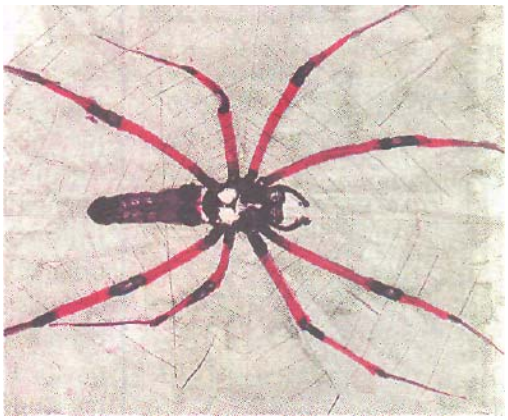


Illustration by Prema Iyer©

THE HINDU **Saturday,** *June 1, 2002*

Sense *& Nonsense*

Solitary splendour

Text by
MADHAV GADGIL



With a stocky build and stumpy tail
A Pitta looks as ugly as hell;
But its buffs and blacks and whites and blues
Have painted it in heavenly hues'.

With a stocky build and a stumpy tail, with sturdy legs and a tough beak and with a multitude of sparkling colours, the Pitta is a striking bird. Perhaps a little too striking for its own safety, so it spends most of its time in solitary splendour, skulking in woods and scrub. Birds are adept at taking advantage of their mobility to find a breeding time and place where the going is good, and then move on to some other suitable locale in the non-breeding season. Thus the Siberian Crane breeds in Siberia in summer, moving on to the Indian subcontinent in winter. But Pittas are rooted in the Indian soil; so they breed north of the Vindhyas in the monsoon months and spend the dry season in the south. While on the move, many other migratory species congregate in large flocks. Not so the eye-catching Pittas; they too move simultaneously in large numbers, but widely dispersed in ones or twos. For them safety lies, not in numbers, but in solitude. ©

THE HINDU, Saturday, September 16, 2000

Sense & Nonsense

Sons of our soil

MADHAV GADGIL

She thought she
saw a tree frog
floating on to a
trunk;
She looked
again and found
it was
a rufousbellied
skunk;
To try such a
foolish stunt she
said
the skunk must
be fully drunk!



Floating leisurely from tree to tree with the help of the outsized webs stretched between its long fingers the Malabar Gliding Frog is a fascinating creature. It is a tree frog, with adhesive suckers at its fin gertips providing a firm grip as it moves around on branches and leaves lapping up insects with its long tongue. It is one of the hundred and twenty species that croak in the forests and pools of the Western Ghats; as many as eighty seven of these are found nowhere else in the world. Indeed frogs are among the truest sons of our soil, having evolved long before the Indian landmass finally joined the Asian continent sixty million years ago. A high proportion of our freshwater fishes and reptiles had also evolved before this event, while the subcontinent was on its long journey across the oceans from somewhere near the tip of South America.

In contrast most of our bird species are more recent colonists; so that only fifteen out of five hundred odd species are restricted to the Western Ghats. ©

THE HINDU **Saturday,** *February 1 7, 2001*

Sense & Nonsense

Spear *fisherman*

MADHAV GADGIL



Prem Iyer

The *snake-necked darter*
Has a fervent wish,
To fish and fish and fish;
And, oh, never
To end forever
As a croc's juicy dish!

like their constant companions, the cormorants, darters are among those descendants of land animals that have gone back to water to live

off their distant ancestors, the fish. Darters hang around swamps, rivers, irrigation ponds, swimming low with just the snake-like head and neck showing above the water.

From time to time, they disappear entirely below the surface to chase and transfix fish with a lightening thrust of their spear-shaped bill. This strike is powered by a spring-like straightening of the bend in their long necks. The quarry is jerked off smartly on coming to the surface and swallowed head first.

When their bellies are full, darters emerge from water and settle on stumps and trees, hanging out their wings to dry, which surprisingly enough cannot stand wetting. Crocodiles and otters are amongst their most formidable rivals in the fishing enterprise; and, of course, crocodiles are happy enough to add some other flavours to their fishy diet with a snack of darter or otter flesh. ©

THE HINDU **Saturday,** *August 24, 2002*

Sense & Nonsense

Spinning away

MADHAV GADGIL

Hiptage bengalensis It's
twists, turns and spins
— is *A sight that stirs*
As the seed whirs!

In this ever-changing world, advantage lies with creatures on the move. Those who hang about in the same place, generation after generation, lose out to those who shift around, on the lookout for greener pastures. This holds as much for plants rooted in one spot, as for the mobile animals. So plant seeds use a variety of devices to get away from the parent.

They tempt animals with the sweet pulp or harpoon them with spears to hike a ride in their skin or fur. They float on . water. And many of them fashion parachutes, wings or propellers to ride the wind. Hiptage or Madhumalathi, a climber of Indian forests sticks an elegant three-bladed propeller on to each seed. When a gust of wind detaches them, they provide an

Prema Iyer



enchanting sight rapidly spinning as they rise with updrafts or float down to earth.

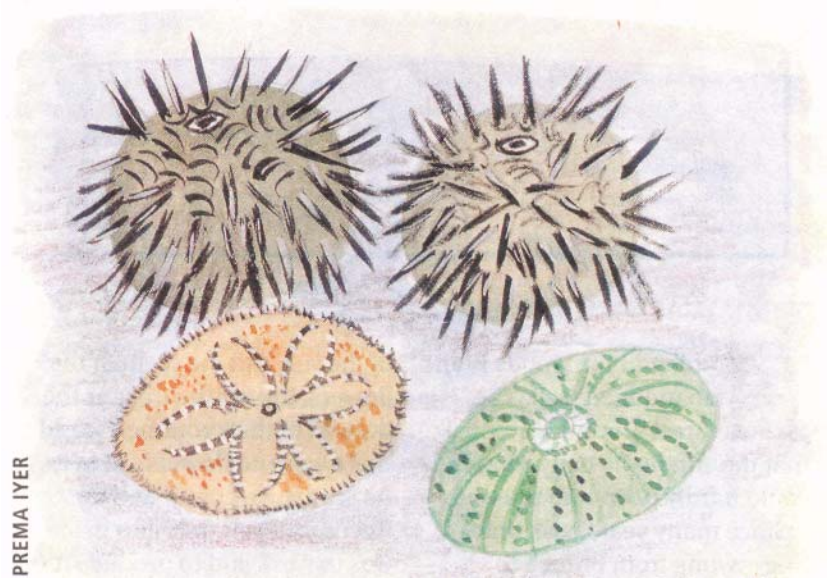
It takes little imagination to think of them as squadrons of helicopters engaged in intricate manoeuvres. ©

THE HINDU **Saturday,** *November 4, 2000*

Sense & Nonsense

Spiny *goblins*

MADHAV GADGIL



PREMA IYER

Fairy shrimps are asking
Sea-urchins for a dance, but
take a proper stance; Step, I
say, not stumble, with spines
all a -jumble, you won't
stand a chance!

Sea-urchins are the porcu pines of rocky shores and shallow seas. Their globular stiff limy skins bristle with spin's long and short, some with toothed appendages equipped with poison glands.

They desperately need this protection, for they are sluggish, creeping around at less than a snail's pace, grazing on everything stationary, plants like algae, as well as animals like sea-anemones and barnacles. They occur in great abundance, sometimes so dense that spines of neighbours are jumbled together. Naturally enough, they are a favourite target of starfish, fish and sea-birds.

Deterred as they are by the lines of defence that sea-urchins put up, the predators break through them. The starfish have a protrusible gut that creeps in between the spines to get to the soft parts and digest them, while gulls pick sea-urchins up by spines and drop them on rocks from a height to shatter them.

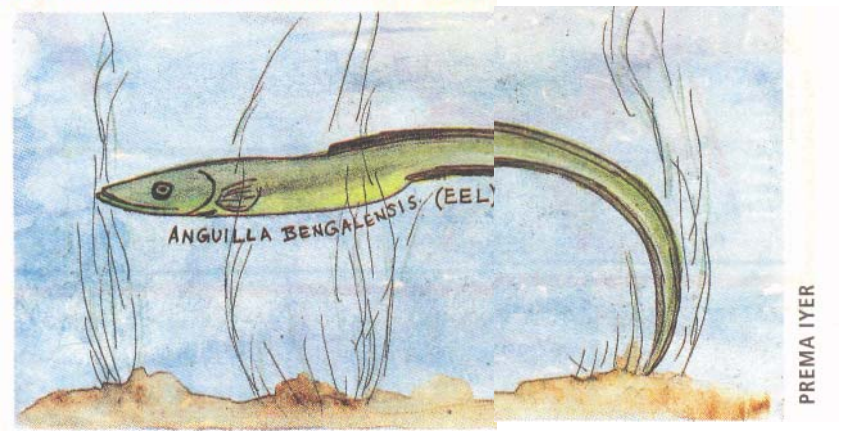
Sea-urchins are a boon to many smaller creatures who turn this spiny forest into a shelter, with tiny shrimps and fish dancing amongst them and barnacles settling on them. ©

THE HINDU **Saturday,** *September 1, 2001*

Sense & Nonsense

Sweet and salt

MADHAV GADGIL



While elvers greet
waters sweet as a
great treat; A grown
up eel longs for the
feel of salt on its keel!

The fishy lineage originated in the sea, which still harbours most members of the clan. A minority has moved into fresh waters where they feed, breed and grow up. But the Indian Longfin and other freshwater eels are special. These snake-like slip pery creatures spend 10 to 15 years in rivers and lakes, eating and putting on weight. On reach ing maturity though they feel an urge to go back to their ancestral home to launch forth the new generation. Migrating to the sea they spawn and bid goodbye to the world.

On growing to a decent size the young eels or elvers make their way to the coast forming huge swarms in estuaries. Entering fresh waters they move on, all the way to smallest streams, ponds and paddy fields. Under cover of darkness, they are not loath to come right out on land, slithering like so many slimy snakes. Indeed villagers suspect them of gobbling up young chicks. Of course, people hit back, eels being a favourite food all over the country. ©

Sense & *Nonsense*

Terminators? Not they!

MADHAV GADGIL

Cockroaches are learning To relish raw wood As good food To chew it and savour And love the flavour As termites should!

Termites are sociable cockroaches that have mastered the art of digesting wood. They practice social division of labour, with workers, soldiers and a royal caste. But unlike bees and ants, termites believe in gender equity with males and females toiling together. The biologist Carl Linnaeus called them termites, since Europeans thought of them as terminators of wooden structures. But in nature, termites are great sustainers, providing much valued food supplies at the beginning of the wet season before other food sources have recovered from the dry summer. At this time, tens of thousands of winged reproductive males and females break out of their colonies to rise into air at once, like a column of smoke. These flying termites are well supplied with fat and proteins in order that they may start new colonies without having to leave the shelter of their chamber to forage for food. Of course, only a lucky few survive to ,found new colonies; the rest provide a grand feast to hungry multitudes of frogs and lizards, birds and bats. ®



Sense & Nonsense

THE HINDU, April 10, 1999

The big cat

Tiger, tiger burning bright,
To kill a cow is your right:
But a grand beast of your might,
Should spare us from such a plight!



TIGERS sit majestically on top of nature's food chain. They symbolise the rich diversity of life which has steadily grown over three billion years of evolution through successive stages of decomposers, green plants, herbivores and carnivores. Tigers prey on the largest of land animals; they even hunt young elephants. Cattle, horses, even humans are their victims; so people have developed a love-hate relationship with this magnificent animal. All over rural India tiger deities are worshipped with the prayer that they should leave people and their livestock alone. And, of course, tigers are protected in a wide network of Project Tiger Reserves spread throughout the country.

Illustration: Shubha Sunder

MADHAV GADGIL

THE HINDU **Saturday,** *February 15, 2003*

Sense & *Nonsense*

The crimson brigade

MADHAV GADGIL

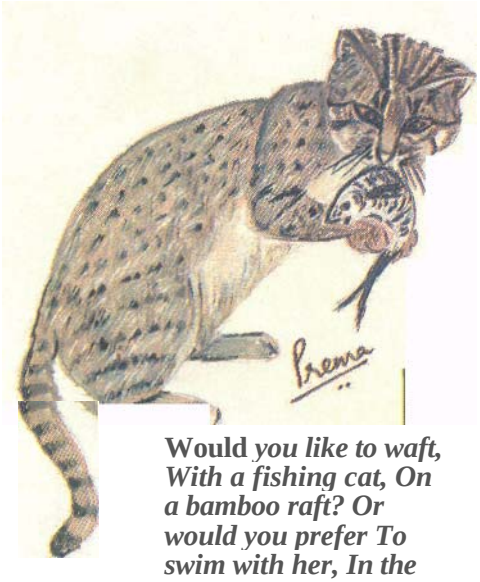


With a sword for a pod And a bloom blood red,
Flamboyant stands proud Its trunk's buttressed!

As spring slips into summer, gardens and avenues all over the tropical world erupt into a crimson blaze. So do the drier forests of the Indian Ocean island of Madagascar from where the colourful tree, Gulmohar, has spread out to girdle the globe. Variously known as flamboyant, *mayil konrai, katti-kai, Sima Sankesulu,* or *Alasippu,* it is a most attractive medium sized tree with a chunky trunk flanked by an array of buttresses. Its branches arise not far off the ground to fashion a flat-topped m canopy of large, £ finely dissected, feather-shaped leaves, adorned for much of the year by long lasting sword-shaped pods. The Gulmohar is at its finest when the leafless tree bursts forth into scarlet blossoms with a touch of white, yellow and red on the hindmost petal. The spread of this beautiful tree all over the world in the 19th Century has been a part of the on-going process of the whole world coming together. As with everything else in this world, globalisation too has its pretty and ugly face!

Illustration by Prema Iyer©

The fierce fishing cat



Would *you like to waft, With a fishing cat, On a bamboo raft? Or would you prefer To swim with her, In the river?*

NATURE likes the ecological stage to be milling with actors. So the evolutionary play entails a continual turnover and proliferation of species individually specialised to play a variety of different ecological roles. As the dinosaur hunters quit the stage, crocodiles and monitor lizards moved in to take their place. But these cold-blooded reptiles were not versatile enough. That vaccum was filled by the evolution of a great variety of mammalian carnivores. The earth today harbours 266 species, as many *as 57* of these occur in India. All of them have their own special way of making a living; one such fascinating creature is the fishing cat. Seals and others live and catch fish in water. The fishing cat lives in riverine forests and reed beds and hunts everything from insects and crabs to fish, frogs, birds, even small mammals. It is a fierce beast smaller than a panther, but quite capable of mauling one in a fight. Its speciality is to get on to rocks overhanging water, and swipe at fish with its paws as they swim by.

Illustration by Prema Iyer

MADHAV GADGIL

The Hindu, Young World, July 17, 1999

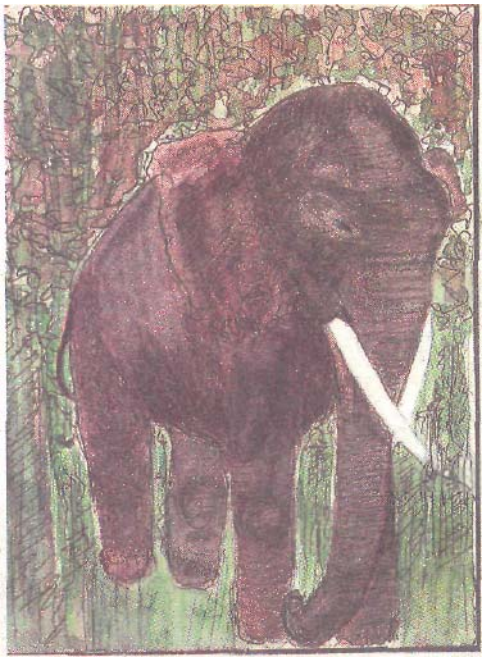
THE HINDU Saturday, *April 10, 2004*

BANGALORE

Sense & Nonsense

The Palghat puzzle

MADHAV GADGIL



Time has come, the elephants felt To leave hot plains alone, To stick to the hills, and call Palghat A strictly no walk zone!

Elephants walked out of Africa and on to the Indian sub-continent much before man did, fully 20 lakh years ago. Like us, they thrive under a wide variety of conditions, and early elephants must have had a run of the whole country. Today they are restricted to the more hilly wooded tracts such as those of the Western Ghats south of Goa. Molecules of their hereditary material now permit us to unravel their history. Such a study by Vidya of IISc has brought out a startling fact: elephant populations of the Nilgiris have had no genetic exchange with populations south of the Palghat gap for over two lakh years. Possibly, there was for a long time, a huge lake in the Palghat gap that cut off all elephant migrations. Or there may have been a distinct plains population that did not mix with the hill populations on either side of the gap. The plains elephants may have disappeared after Palghat was brought under the plough 3000 years ago. Hopefully, one of these days we will find out the answer to this fascinating puzzle.

Illustration by Prema Iyer ©

The quaint hornbill



Once *upon a Narcondam hornbill Looking for a thrill, Flew to the top of the hill, And caught a frightful chill, So wearing a cowl, He went to Dr. Owl, And had to swallow A very bitter pill!*

Sense & Nonsense

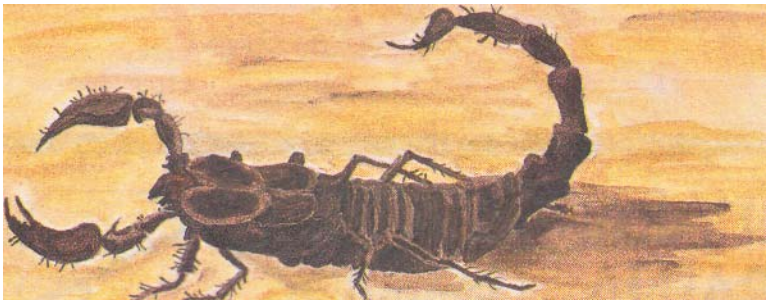
HEORNBILLS are among the quaintest characters of forests and grasslands of sub-Saharan Africa and tropical Asia. Medium-sized to large birds, they are notable for their long, curved beaks often topped with a casque. These enormous yet very light beaks enable them to pluck fruit from tips of slender branches while sitting securely on stronger limbs of trees. Hornbills are famous for nesting in big tree holes with the female firmly ensconced inside with most of the opening sealed up. There are 50 species of hornbills worldwide, nine of them in India. The rarest and the most narrowly distributed of them is the Narcondam hornbill, with a few hundred individuals confined to six square kilometres of the forested slopes of an old volcanic hill rising to 700 metres that constitute all of this tiny island of the Andaman-Nicobar chain. The "doctor" in attendance is a barn owl.

Illustration: Shubha Sunder

MADHAV GADGIL

THE HINDU March 13, 1999

The tiger arthropod?



Scorpion

Scorpion is a beast of the spider ilk,
That packs poison in its tail, in place of silk
The great big lady dominates the male.
And eats him up, lest he get stale!

SCORPIONS are the tigers of the arthropod world. Along with mites and spiders, millipedes and centipedes, crabs and shrimp, bugs and beetles they belong to this highly diversified group of animals, accounting for over two thirds of all described species. With a tough yet flexible external skeleton, arthropods are well equipped for a life on land. Most are small, between a half to one and a half centimetres in size. Scorpions are much larger, the smallest being one and a half centimetres and the largest 18cm. in length. Armed with powerful pincers and a venomous sting, they hunt down crickets and cockroaches, ants and grasshoppers. But the female of the species adds a rather unusual item to its diet, the male, who is often swallowed promptly after its job of fertilizing the eggs is over. 102 species of scorpions have been described from India; so with just over 2per cent of the world's landmass we harbour 16 per cent of the global scorpion diversity.



Illustration by Shuba Sunder

MADHAV GADGIL

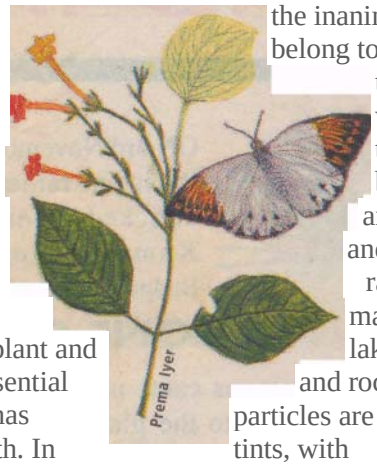
THE HINDU- **Saturday,** *October 16, 1999*

Sense and Nonsense

This colourful life

MADHAV GADGiL

Great Orange Tip, It loves to sip And flutter by, A true butterfly!



An orange-tip on a mussaenda blossom - what a riot of colours! A flowering plant and a butterfly are quintessential examples of how life has brought colours to earth. In the inanimate world, colours belong to the heavens where the tiny particles of gases, water and dust scattering the light create the azure blue of the sky, the reds and oranges of the sunset and the rainbow. These colours may be reflected from rivers, lakes and seas. But the soils and rocks with their coarser particles are of grey, black and brown tints, with occasional touches of red and ochre. Life first brought colour on the earth when it fashioned green molecules of chlorophyll to tap the energy of sunlight.

Plants evolved coloured flowers to allure pollinators, while animals evolved wonderful tints to appeal to mates. That is what has covered our drab world with a magnificent tapestry of the greens and blues, yellows and oranges that surround us. ©

THE HINDU **Saturday,** *January 12, 2002*

Sense & *Nonsense*

Tiger striped

MADHAV GADGIL

Sharp is its sting And it's full of VAAM; This wasp'll have a fling At a Marathon slam!

Vsspas are 'ood-sized wasps that live in enormous hives constructed out of plant fibre. To warn all comers of their deadly sting, they are boldly striped — tiger fashion — in yellow and black. Hence the Tulu name: tiger-bums. The wasp feeds its larvae on smaller insects and spiders that it hunts on long forays that add up to as much as 100 kilometres - or two Marathons — a day. Japanese scientists discovered that the secret of this stamina lies in a mixture of amino acids that the larvae secrete as nourishment for the adults. This potion permits an animal to burn up its fat ahead of the more readily usable glycogen, thereby leaving open the option of drawing upon the latter in a pinch — such as a last sprint at the end of a marathon run. This has been developed as a sports beverage called VAAM - Vespa Amino Acid Mixture.



Prema Iyer

Apparently it was this concoction that helped a Japanese lady, Naoko Takahashi win the women's Marathon gold medal at the last Olympics in Sydney. ©

THE HINDU *Saturday, October 26, 2002*

Sense & Nonsense
Touch me not

MADHAV GADGIL



An Ashoka smiles through its flowers and leaves,
With reds and yellows and a coppery sheen;
Gracing the streams and woods of the hills,
Pining for a playful kick from a queen!

With a verdant canopy adorned by bunches of red and yellow flowers, Ashoka is one of our loveliest trees. It has a reputation of bringing out its best blooms only when kicked by a pretty maiden, as Malavika did with such dramatic consequences in Kalidasa's famous play. As charming as Ashoka's blossoms are its copper hued tender leaves. But, while the reds and yellows of the flowers have evolved to attract pollinators, the rufous tints of the young foliage might be serving to repel unwelcome insect predators. These juicy leaves are a most tempting dish for the teeming insect hordes, and plants attempt to keep them at bay with a cocktail of toxic chemicals. But producing the repellents costs energy; so plants concentrate them in the most vulnerable stages. As a result the tender leaves are often far more toxic than the full-grown tough ones. The reddish colours of the new leaves are suspected to be a warning to insects that though they may look tempting, it would be prudent to leave them alone! ©

THE HINDU **Saturday,** *September 7, 2002*

Sense & Nonsense

Triple Jeopardy

MADHAV GADGIL

Lesser Florican-Of-the Bustard clan, Is barely hanging on As best as it can!

Day by day, our world is losing many of its feathered jewels. Indeed, fully ten per cent of India's bird species are today threatened with extinction. Included amongst them is the handsome Lesser Florican, a member of the Bustard family.



Bustard means a bird that walks, and these birds of the open country prefer to use their long legs over their wings. They are birds of a good size, the Lesser Florican exceeding half a metre in height. They were once abundant in the grasslands over much of the Indian sub-continent, and early British chronicles record their being hunted in large numbers for the table. While the British hunters are long gone, the species is now being threatened by the rapid loss of its grassland habitat for cultivation.

Being a large sized bird means that they require extensive habitat patches and occur in relatively low densities. Their size, the excellent taste of their flesh, and their preference for grasslands thus places them in triple jeopardy, rendering them one of our highly endangered species.

Illustration by Prema Iyer ©

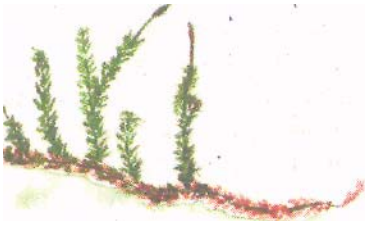
THE HINDU Saturday, January *17, 2004*



Two-in-one

MADHAV GADGIL

I would love to toss A brick lined with moss At my boss; But I greatly fear He will never endure The wear and tear!



Mosses are small, rather primitive green plants. A mature moss represents two distinct generations. The lower, more prominent part with roots, stem and green leaves has just one set of hereditary elements or genes, a stage that is pretty much confined to the reproductive cells of higher plants and animals. On the other hand, the upper half bearing the spore capsule carries two sets of genes, one derived from each parent, as do the bodies of all higher plants and animals. In the more primitive sea weeds the two generations are independent stages that with two sets of genes embodying larger plants living in more turbulent waters, the stage with a single set of genes fashioning smaller plants that thrive in more sheltered conditions. Notably enough, the more advanced ferns also produce two independent generations, but their smaller generation with a single set of ,_ genes leads a much more precarious existence. It is such manifold permutations and combinations that have promoted the incredible diversity of life on earth.

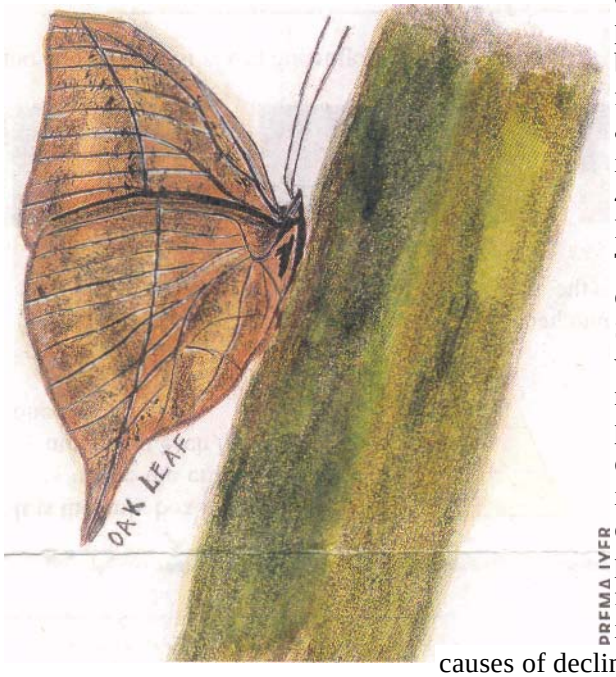
Illustration by Prema Iyer©

THE HINDU **Saturday,** *November 17, 2001* ,

Sense

Use it or lose it

MADHAVGADGIL



"Safe, we'are safe!" Chirped Oakleaf,
"We are now in Schedule two!"
"That's all very well", shot back his wife,
"Better stick to camouflage too!"

With folded wings, one may easily mistake it for a wrinkled brown leaf, but when it takes off, its bright blue upper wings are a sight for sore eyes. So this forest butterfly can be a prized item in a collector's cabinet. Over years such trade has been a serious drain on wild populations of butterflies, so fully 450 of them are now protected in Schedules 1 to 4 of the Wildlife Protection Act. The Oakleafs are covered under Schedule Two, which imposes moderate levels of penalties for catching them. It is not entirely clear how far this protection works, for it leaves out important root causes of decline such as habitat destruction and pesticide poisoning. But it does preclude butterfly farming, an enterprise with a great deal of promise for the tribal tracts. Properly organised, butterfly farming may indeed further the cause of butterfly conservation. Indeed, some would argue that Indians must now begin to pay serious attention to the new slogan: "Use it, or Lose it!" ©

THE HINDU **Saturday,** *October 12, 2002*

Sense & Nonsense

Water harvesters

MADHAV GADGIL



How craftily doth Diacamma
Gather the morning dew, Even
though there be no queen To
orchestrate the crew!

Ants — those supreme social beings, have many a trick up their sleeve. One such, discovered twenty years ago on the campus of the Indian Institute of Science in Bangalore is the use of bird feathers to harvest water. The ant that has evolved this intriguing practice is called Diacamma, a largish grey-black ant that belongs to the rather exclusive club of queen-less species. All female Diacamma adults emerge with wing buds and can breed. The reigning egg-layer in the nest converts them into sterile workers by biting off the wing buds. Diacamma nest underground and pile bird feathers around the nest entrance; the large communal roosts of Crows on our campus furnishing a handy source of feathers, plucked and dropped as the birds preen before dozing off. With their web of fine filaments, feathers are an ideal substrate for condensation of the dew. Early mornings in the dry season they serve as veritable water fountains used not only by Diacamma, but other smaller ants that slip in to quench their thirst as well.

Illustration by Prema Iyer ©

THE HINDU **Saturday,** *June 17, 2000*

Sense *& Nonsense*

Watery *giants*

MADHAV GADGIL

Once upon a jelly fish
Floating in the seas off Mangalore
Thought she must see Bangalore
So she sprouted a wing
And took of with a zing,
That watery giant of Mangalore!



Life originated in the sea and water remains the most abundant constituent of the bodies of most living creatures. But the champion water-lovers are jellyfish; some of whom are 98 per cent water. They are amongst the simplest of animals, umbrellas strung with long tentacles made up of just a few types of cells arranged in two layers. Some jellyfish reach enormous sizes; the Lion's Mane has an umbrella two metres in diameter with 150 tentacles that may reach a length of 40 metres. They hunt shrimp with the help of special attacking cells loaded with a poison that come in three forms - piercing, wrapping and sticking. All the attacking cells are equipped with a little trigger, which sets them off the instant it is touched without waiting for an instruction from the primitive nervous system. This renders these simple bodied watery giants formidable predators, sometimes reaching incredible densities, clogging surface water of the sea for kilometres on end.®

THE HINDU **Saturday,** *August* 9, 2003

Sense & Nonsense

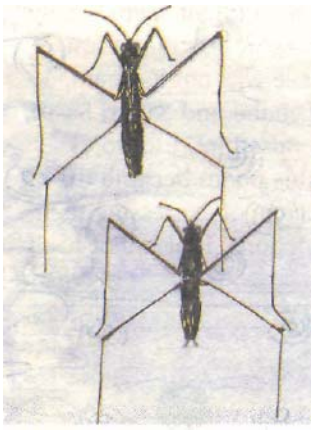
Waves of threat, ripples of love

MADHAV GADGIL

Water is a rug, for this bug,
Who gets her grub And the mate she craves By listening to the waves

Insects and master of land, surpassing the diversity of all other groups of animals put together- They have even managed to colonise fresh waters, though without really overcoming the challenge of shrimps and snails.

But insects have miserably failed in their bid to storm the marine realm. Not entirely though, for there is one group of bugs, the sea skaters, that proudly rides the ocean waves. Sea skaters are relatives of



water striders that promenade on ponds and lakes, and on the quieter stretches of streams and rivers.

Their middle and hind limbs are equipped with pedestals that possess extensive water repellent surfaces, so that their lightweight is supported by the surface tension of the water.

They are exquisitely sensitive to all movements of their fluid platform, employing these to locate prey, often other insects that get trapped by the surface tension. It is but a small step from this for the males to send out waves of threat to warn off rivals and ripples of love to attract mates.

Illustration by Prema Iyer©

THE HINDU **Saturday,** *December 29, 2001*

Sense & *Nonsense*

Wear what you devour

MADHAV GADGIL

How shocking, that a bunch of leaves, should munch on leaves!
But it can occur, with a grasshopper, that deceives!

They live amongst leaves, feed on them and have bodies that look just like a bunch of leaves. Even their legs have leaf-like projections. Why is it, ecologists are wont to wonder, that there are so few of these superbly camouflaged leaf insects amidst such plentitude of green leaves that nourish them? Why don't they, or their cousins the grasshoppers, more routinely multiply to levels at which they strip the vegetation of all its green foliage? The answer seems to lie in the variety of chemicals that flowering plans have evolved to keep the greedy insects at bay. These molecules disrupt the insect metabolism in a variety of ways, for instance, forcing the larvae to keep on growing when they should stop doing so and get on with the £ task of changing into an adult. Man, as so often, takes advantage of this struggle, learning to enjoy the flavours of molecules evolved by plants to discourage insects; flavours such as those of tea and lemon grass, mint and thyme, curry and coriander leaves.

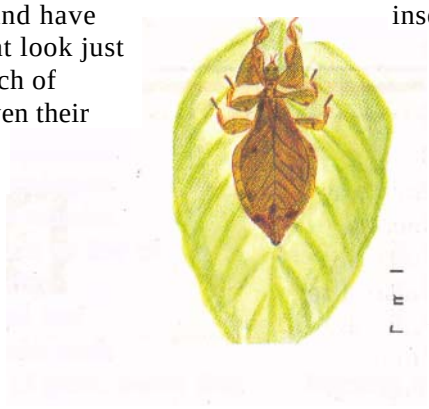


Illustration by Prema Iyer ©

THE HINDU **Saturday,** *October 4,* ***2003***

Sense & *Nonsense*

Wedded to water

MADHAV GADGIL

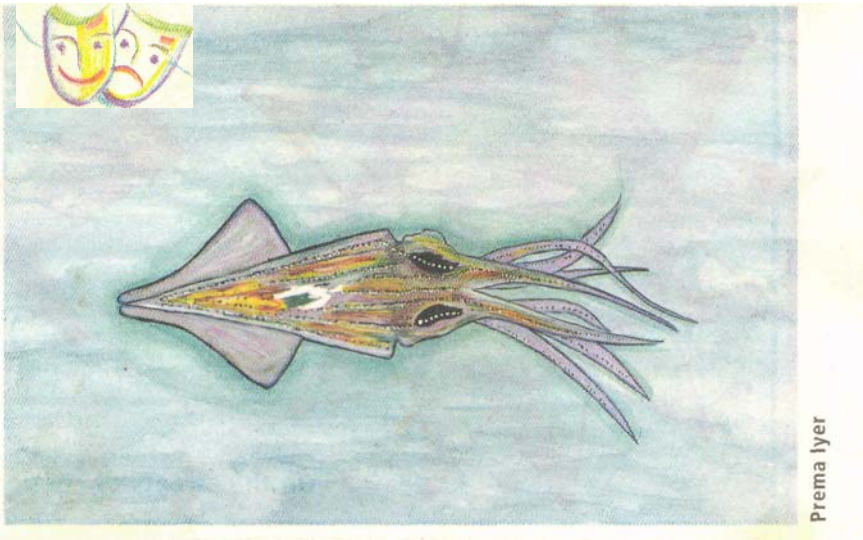
To leave this world so wet,
To rise and shine and seek the sun
My crown of frond's all set!

Tree ferns are relics of an ancient age; close kin of the earliest of trees to clothe the land. These appeared as early as thirty-six crore years ago, just nine crore years after the first tiny plants colonised the land. Indeed, the thallus phase of the ferns resembles these early land plants. These small flat thalli grow out of spores sperms that must swim through a film, of water to fertilise the eggs that then grow into adult ferns. Three ferns possess a number of innovations that go to make a tree: a covering resistant to loss of water, tubes to conduct water and nutrients, support tissue to grow tall to compete for light, and flat leaves to soak up the light. But they still need water to breed, and they cannot branch so that their crowns remain straight and narrow. As a result, they are now confined to just a few habitats, such as the wet valleys of the Western Ghats. ©



Prema Iver

THE HINDU **Saturday,** *April 22, 2000*



Sense & Nonsense

Whale *of a snail*

MADHAV GADGIL

Laugh of a squid is colourful and gay,
And runs into peal after peal,
It is tickled quite pink when its ink blocks the way,
Of a whale and makes it squeal!

The biggest, brightest, fastest animals in the sea include our own relatives, seals, whales and sharks and those of the lowly snails and oysters, squids and octopuses. While octopuses stick to the solid bottom, squids swim in open waters. The smallest of the squids are only a centimetre in length, but the biggest grow to enormous sizes in the middle depths of the oceans. The largest recorded had an eight- metre -long body topped by 14- metre- long tentacles. These big squids sport the largest eyes of any animal, fully 40 cm in diametre. They have a keen sense of smell as well, and big brains with giant nerves. Their sensory capabilities are matched by expressive ones, with shifts in moods reflected by waves of changing colours. Whales are the main enemies of these squids and to foil them they squirt clouds of black ink stored in a special sac. One can only marvel at the forces of evolution that have created such versatile giants out of relatives of slow, little snails. ©

THE HINDU Saturday. *April 19, 2003*

Sense & Nonsense

What's in a name?

MADHAV GADGIL

Do you know of a climber
That doth bear
Many a golden chandelier
Thunbergia if *is*
A source of bliss
Our own mysorensis!

Ambling through the rain forests of the Western Ghats on a cool winter morn, you may come across one of the world's prettiest sights. *Thunbergia mysorensis* in full bloom. It's lovely, drooping, chandelier-like sprays flaunt a most charming combination of the bright orange of the Flame of the Forest, the blood red of the Coral tree, and the golden yellow of the Indian Laburnum.



Nowadays, of course, you will also find the chamber in gardens and hothouses all over the world. For it has been widely propagated following its first introduction to English botanical gardens in 1853, when it reportedly caused great excitement.

The vine, is known to the locals as a pretty plant, but they have no name for it. After all a majority of the ornamentals that we Indians have brought under cultivation are fragrant, which this creeper is not. So it only has a rather English name, the Mysore hexacentre. But, by any name, or lacking one, it still presents a most gorgeous sight. ©

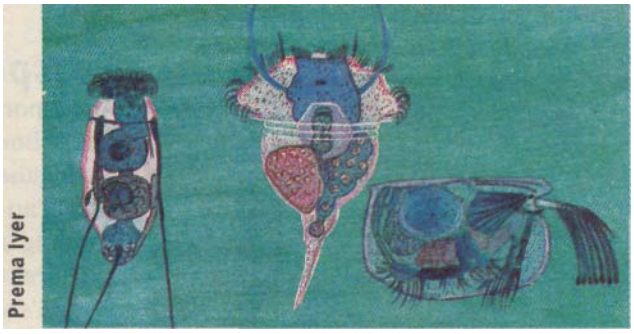


Sense *& Nonsense*

Wheeler-dealers

MADHAV GADGIL

Water fleas are urging rotifers to spin,
But, please, make no din; Spin,
I say not sputtle,
Wheels, all a shuttle,
That's the proper style!



Rotifers, alias wheel animalcules are tiny creatures that abound in waters swimming around with the help of cilia or tiny whip- like oars disposed in a circular fashion. In motion these ciliary bands look like spinning wheels, hence the name. Rotifers are remarkable in that many of them have totally dispensed with the unfair sex. After all males fully share the burden of bringing up offspring in only a few species like mynas and wild dogs. In most others all they provide is genes to complement those in the eggs. In the queendom of rotifers, the females produce eggs with the full complement of genes, and the males may never appear on the scene. This is surprising for it is believed that while males may be otherwise totally useless, their genetic contribution permits continual adjustment to changing environments. Yet rotifers appear to live in environments as changeable as those of any other animals. So how come these wheeling dealing women get away without husbands? Nobody as yet has an answer. ©

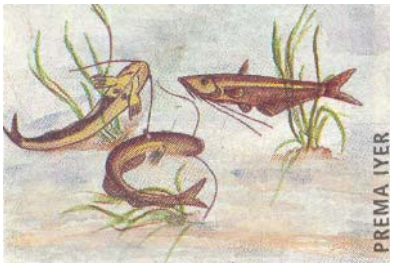
THE HINDU **Saturday,** *April 14,* 2001

Sense & Nonsense

Whiskered giants

MADHAVGADGIL

Long, flat and plump,
this fish is no chump:
Nothing is brisker, than
its cat's whisker!



Like cats, catfish are armed with two or three pairs of long trailing whiskers, or barbels, that help them navigate close to the bottom and in turbid waters. They account for 150 out of 600 odd species of our fresh water fishes. Catfishes range in size from 15cm to over two metres. The scientific name of the largest Indian species is Wallago attu, after its Telugu and Tamil names Walaga and its Malayalam name Attu Vaalay.

Called Shark Catfish in English, this long, wide mouthed, small eyed fish is an aggressive, voracious feeder hunting down all smaller fish. Normally a bottom dweller, it rises to the surface to breed in the summer. Unluckily for the fish, the courting pairs are so absorbed in each other that they readily fall prey to fishermen. This is indeed a godsend, for a grown up Walaga may yield 50kg of oil rich flesh. In gratitude, people offer them to goddess Kali. ©

THE HINDU **Saturday,** *November 15, 2003*



Sense & Nonsense

Whistling schoolboy

MADHAV GADGIL

Time has come, the blue thrush thought
To out-whistle the school boy,
To set up a nest in right earnest
My heart is full of joy.



Nicknamed the idle or whistling schoolboy, the Malabar Whistling Thrush has its headquarters in some gorge in the Peninsular Indian hills. There is something very dapper and neat about the bird as it hops and flies from boulder to ledge; its shiny feathers pressed close to the body and its tail moving slowly up and down as it spreads its fan of feathers. Moreover, it has a most melodious song, a loud rich whistle rambling aimlessly up and down the scale.

A Magpie Robin's song cheers our ears but its plumage is unremarkable. A House Swift's graceful flight stirs up our wonder and admiration but it looks drab and its call is nothing to write home about. A Peacock has magnificent looks, but a harsh voice and a laboured flight.

But a Whistling Thrush is one of those birds that can charm us in every way, with its looks, voice and movements. Indeed, its seems a living embodiment of all the qualities of vitality and fitness that one associates with unspoilt brooks and hills. ©

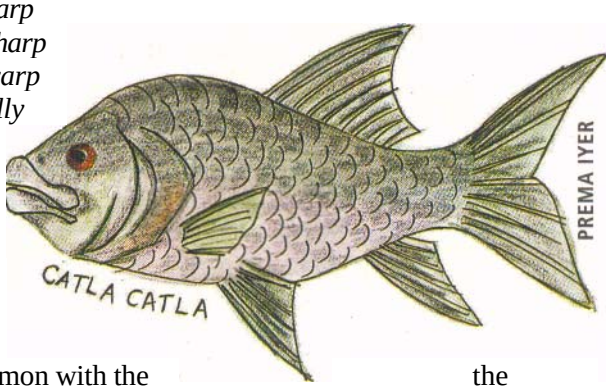
THE HINDU **Saturday,** *August 18, 2001*

Sense & Nonsense

Why carp? *o carp*

MADHAV GADGIL

Catla, the silvery carp
Has little cause to harp
On the hormone warp
As a practice awfully sharp!



Honey bee and budgerigar, buffalo and donkey, cattle and camel have two things in common with the fish catla. They all love company and consume plant matter and therefore can be maintained at little cost under crowded conditions. That is why they have been husbanded by man, beginning with cattle ten thousand years ago.

Catla is among the latest additions, cultured since 1957 when the technique of breeding induced by the administration of reproductive hormones was perfected. This large silvery fish, which may reach two metres in length, naturally breeds during the monsoon along the flooded peripheries of North Indian rivers. When grown to a moderate size it is excellent to eat.

Like buffaloes, cattle and donkeys its natural populations have been largely wiped out; it is however cultured extensively all over India, often as a hybrid with other species of carps. While this had saved catla from possible extinction, it has led, sadly, to wholesale decimation of natural fish communities from many a lake and pond all over the country. ©

THE HINDU **Saturday,** *March 25, 2000*

Sense & *Nonsense*

Winged *Godfathers*



MADHAV GADGIL

A shiny black bird is the drongo
Whose call is louder than a bongo,
With its long curved tail, It twists
without fail,

And as to the fly, its good bye and go! With their glossy black plumage, long forked tails, and loud booming calls, Drongos are prominent members of bird communities all over India. They perch conspicuously on tops of trees or electric wires and sally after flying insects catching them in the air with deft turns and twists. Their beaks are strong enough to deal with an occasional lizard or small bird as well.

Thus equipped these masters of the air have no fear of anybody else on wing, be it a crow, a kite, or a falcon. Especially when nesting they drive away with alacrity any marauder they suspect to be after their eggs or chicks. So they form remarkable associations with smaller, milder birds like Orioles and Doves who build their nests in the same trees. Drongos benevolently preside over this company ensuring the collective safety of all their progeny against the nest robbers. ®

THE HINDU Saturday, *December 6, 2003*

Sense & Nonsense

Wolf in a sheep's clothing

MADHAV GADGIL

The bug is in my hand And
the beetle's well in tow Sugars and proteins
grand Are all at my command, And
Drosera's happy now!



Droseras are remarkable little herbs, their leaves bearing numerous tentacles topped with glistening globs of a sticky fluid. Look a little closely, and you will see some of these leaves curled around a fly or a bug. Droseras are among the few hundred species of plants that have turned the tables on the tribe of insects. There are plants that defend themselves with leaves covered by bristles that may be stiff enough to pierce the bodies of insects grazing on them. Other plants attract insect pollinators with brightly coloured petals and reward them with droplets of nectar. Droseras combine these two arts, attracting insects with dazzling little globules that mimic nectar and then killing and digesting them,. This is a much costlier process than that of roots absorbing nutrients from the soil But these carnivorous plants grow in a water logged, infertile soils where normal plants cannot survive. They are a wonderful example of how living beings keep colonising newer and newer environments, evolving novel and often more intricate ways of facing up to the challenges.

Illustration by Prema Iyer©

THE HINDU **Saturday,** *December 16 2000*

Sense & Nonsense
World *citizen*

MADHAV GADGIL



The blackwinged stilt was covered with guilt, for having stepped in mud, that was full of crud!

Some species of birds are , parochial, others cosmopolitan. Many tropical forest birds are restricted in their range; the Nilgiri Laughing Thrush, for instance, is confined to the Blue Mountains.

Water birds are not so finicky; many have broader ranges. Foremost among the cosmopolitans is the Blackwinged Stilt, a lanky pied black and white bird with a long slender bill and enormously long, thin reddish legs. These enable it to tap food supplies normally out of reach of most other wading birds, as it walks into deepish water almost to the belly. So it can haunt all manners of marshes freshwater and tidal, small village tanks and large irrigation reservoirs, lagoons and salt-pans.

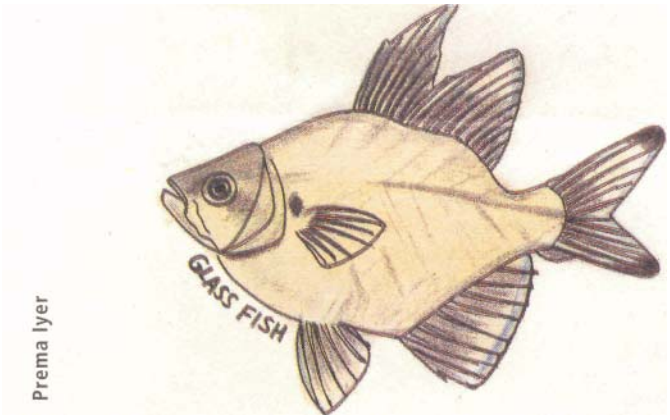
Combining this versatility with a wanderlust, Blackwinged Stilts have come to occupy an enormous geographical range, stretching over Australia and Asia, Europe and Africa, North and South America. So on any continent one may witness a flight of these snow white birds with pointed black wings, their long thin legs trailing comically behind. ©

THE HINDU **Saturday,** *September 15, 2001*

Sense & *Nonsense*

X -ray *fish*

MADHAV GADGIL



She thought she saw a ghostly
Skeleton in a dream,
She looked again and found it was
A Glass Fish in a stream;
To be so gay, this chap, she said,
must be tolerant in extreme!

The Glass Fish has a devilish look with all its bones showing through its translucent skin and flesh. What function this serves in this tiny schooling fish of our fresh waters is unclear. Perhaps, it is related to its propensity to live in polluted, pea green waters where light has little chance to penetrate.

Indeed, the Glass Fish seems to be able to hang on in waters with very low levels of dissolved oxygen. We understand little of what has conferred on the Glass Fish this ability to withstand oxygen deprivation; it is possibly a matter of chance. Indeed, in the intricate drama of evolution being played on the theatre of the earth for the last three billion years, chance seems to have played an overwhelming role in deciding who succeeds, and who goes to the wall.

So all that biologists can do is to speculate, as they do as to why we humans, rather than some smaller flesh-eating dinosaur, or a dolphin or an otter evolved into the first thinking animal with a symbolic language. ©